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ARTES SCIENTIA VERITAS

Gen. Index, Pg. 77
Vol. XIV, No. 5 PHILADELPHIA

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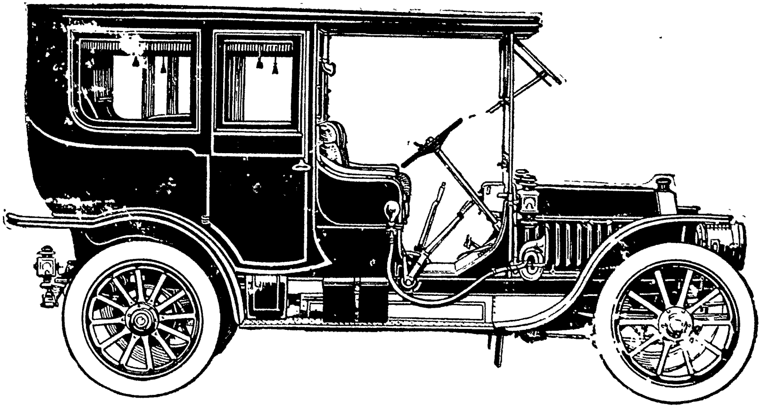
Price, 20c.
NOVEMBER 1, 1909

CYCLE AND AUTOMOBILE TRADE JOURNAL

Peerless



Peerless Car is the Product

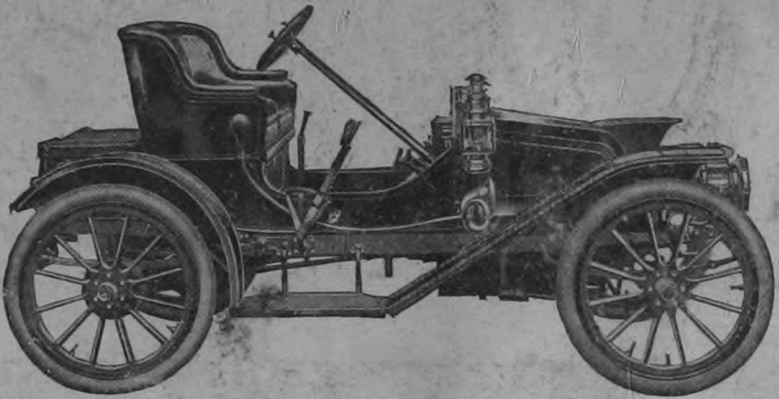
Of a gradual refining process. In its present state it most nearly approaches the highest degree of perfection in motor car construction. The Peerless makes no big claims for recent "improvements"—it has long since attained the highest grade of development. This is the *completed* car.

Catalog F will be sent on request.

THE PEERLESS MOTOR CAR COMPANY
[illegible] 93d Street, Cleveland, O.
[illegible] Association Licensed Automobile Manufacturers.

CH[illegible]INTING C[illegible]PANY MARKET AND 49TH STREET, PHILADELPHIA

MORA "20"



$1050

A classy, stylish, up-to-the-minute Runabout

for the Clubman, Doctor, owner of larger cars and all that particular class who desire the **best** in a small car for their own driving. **Mora "20"** fills this demand.

Built in the works and by the men who have made the **Mora Light Four** famous for being **"Mechanically Right"** is evidence that the **Mora "20"** is also "Mechanically Right."

4 Cylinder **20 H. P.** **32 inch Wheels**

Magneto, Touring Trunk, Full Lamp Equipment, Generator, Horn, Tools.

Write for catalogue giving full details

See our Atlanta Show exhibit, Taft Hall, including a full line of

MORA 1910 LIGHT FOURS at $2500

MORA COMPANY

NEW YORK BRANCH **37 Mora Place**

KEYSTONE GREASE
THE WORLD'S GREATEST LUBRICANT
KEYSTONE
TRADE MARK
REG. U.S. PAT. OFFICE
Keystone Lubricating Co.
MAIN OFFICE & WORKS
PHILADELPHIA, PA.

The VERDICT of COMPETENT JUDGES

to wit:—the leading mechanical engineers—is that

KEYSTONE GREASE

IS

"The World's Greatest Lubricant"

This advertisement is your guarantee of protection. Under the classification of lubricant are sold many kinds of good, bad and awful compounds, and the average man runs a chance of buying a lubricant which will do more harm than good.

Those greases which contain animal and vegetable oils become rancid and form an acid which eats the surface of your bearings and gears. **Keystone Grease** is entirely petroleum in its make-up, and will not harm any metal.

Most greases are either too thin in summer or too thick in winter. **Keystone Grease** is always the same, as it is not changed by climatic conditions.

Keystone Lubricating Co.

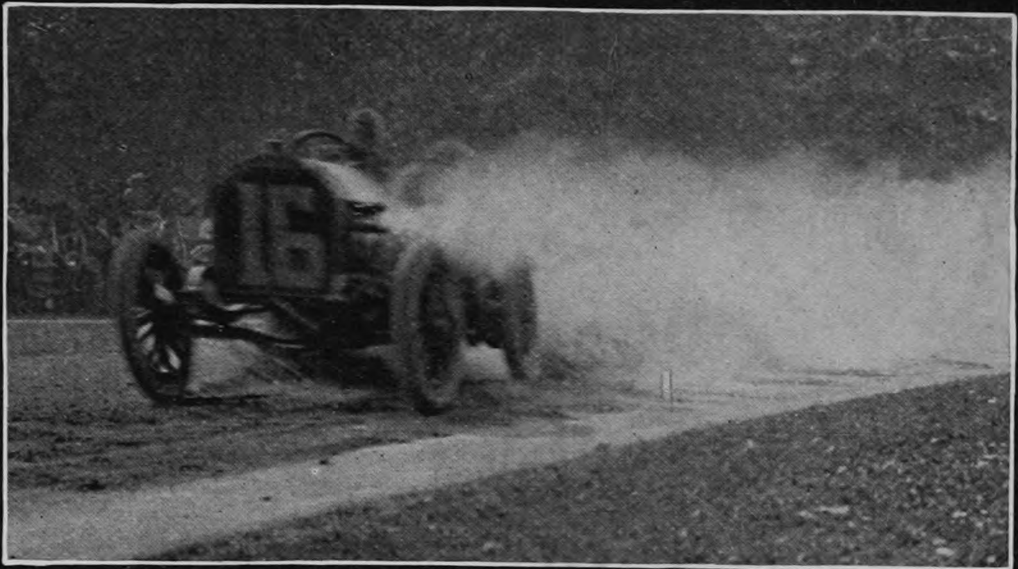
EXECUTIVE OFFICES AND WORKS:

20th St. and Allegheny Ave., Philadelphia, Pa.
New York Office (Automobile Dept.): 1777 Broadway.
Chicago Address: Tacoma Building.
Boston Address: Oliver Building.
New Orleans Address: 610-612 Chartres St.

WE HAVE NO CONNECTION WITH THE OIL TRUST

AGAIN THE PERFECTED

Great Chadwick Six



IS VICTORIOUS

¶ In the Fairmount Park 202½-mile race, the Great Chadwick Six made the fastest lap recorded for the course. The distance per lap was 8.1 miles and the time was 7 minutes, 41 seconds, an average of 63.4 miles per hour, over one of the most difficult courses upon which a long road race has ever been held.

¶ The CHADWICK car also finished fourth, although handicapped before going twenty-five miles, by having three of the spokes of the rear wheel broken as a result of having been hit by a contesting car. This mishap made it necessary to take all curves at a slow rate.

¶ The performance of the GREAT CHADWICK SIX in this contest demonstrates that it is the fastest stock car in the world, that it can be depended upon to go great distance at a high rate of speed. If you are looking for the BEST, and a car of EXCLUSIVENESS, send for our new catalogue describing our 1910 models.

Chadwick Engineering Works

THE OIL THAT WILL NOT CHAR
PANHARD
Automobile
Cylinder
OIL
LIGHT
GEORGE A. HAWS
Lubricating Oils & Greases
New York, U.S.A.

THE NEW CAN
—It's Sealed

PANHARD OIL

"The Oil in the Checker-Board Can"

OIL TALK

To the Trade

SINCERITY OF PURPOSE is the foundation of business success—the confidence that your customers place in your integrity and the knowledge that they get a "square deal" holds your trade—our business is the same.

IT HAS BEEN OUR AMBITION to produce the highest grade of Cylinder Oil. To this policy we have rigidly adhered. In the face of the fiercest competition and price-cutting, at the expense of quality, we have maintained the PANHARD standard. It pays to make the best, for during the season of 1909 the sales of PANHARD have almost doubled.

NOW IS THE TIME TO DECIDE on your oil for next year. If you already handle PANHARD OIL, you know that every customer to whom you sell comes back for more. If you don't, you are losing not only the trade that we make for our dealers by our general advertising, but you are losing out in other lines as well.

BECAUSE every automobilist, even though he may not use PANHARD OIL, recognizes its quality. The red checker-board can is as familiar to him as the make of the car he drives. Our sign in your garage or store is an evidence of the high character of all your supplies, and the man to whom you sell PANHARD OIL you will eventually secure as a **permanent customer.**

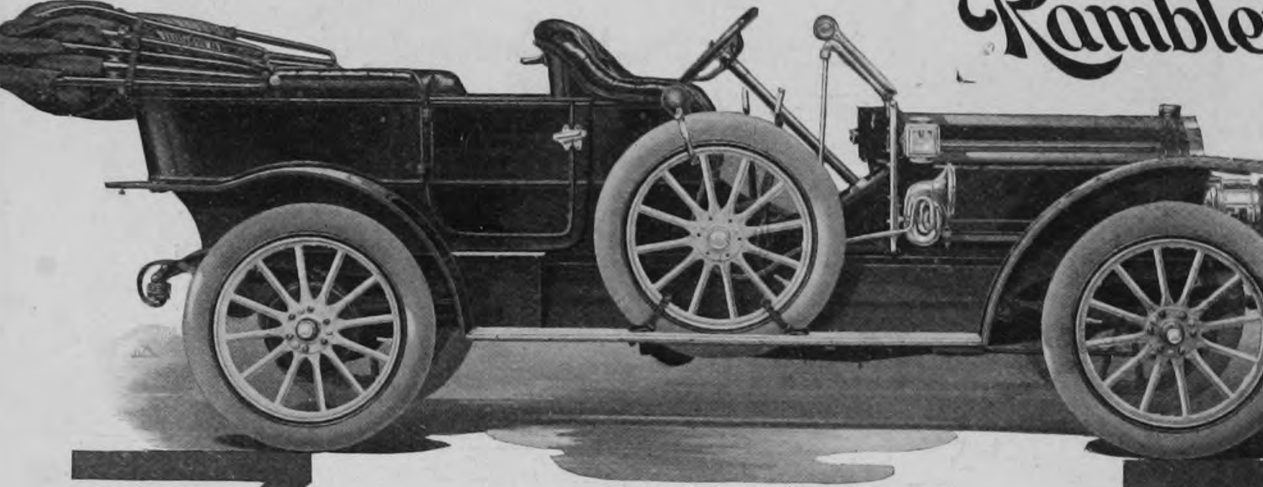
WE WILL EXHIBIT AT THE SHOWS and extend to you a personal invitation to call at our booth at both the Grand Central Palace and Madison Square Garden shows in New York City. Let us make our proposition. Better still, write for full particulars now.

WE ANNOUNCE TO THE TRADE that the New York City court has just handed down a decision in our suit against the H. T. Alexander Co., restraining them from using the name of PANHARD as applied to automobile oil, and giving us the exclusive right to same.

THESE BOOKS WILL HELP YOUR TRADE. We have just issued a booklet, "LUBRICATION." It will fit your envelopes. Our dealers tell us that it has helped them secure more business for PANHARD OIL. It will help you. How many can you use?

GEORGE A. HAWS 72 PINE STREET

THE NE
Ramble



Model Fifty-five, 45 H. P., $2,500, with Magneto, Lamps, Presto Tank and Tools.

THE new Rambler is better than any previous Rambler in quality, dignity, silence and comfort, and in many respects it is superior to any other automobile; built in three models: Fifty-five, seven-passenger, forty-five horsepower, $2,500; Fifty-four, five-passenger, forty-five horsepower, $2,250; and Fifty-three, thirty-four horsepower, $1,800; magnetos included.

Model Fifty-five

Capacity: Seven-passenger.
Engine: Four cylinder, 5 x 5½.
Wheel-base: 123 inches.
Wheels and tires: 36 in. x 4½ in.
Spare wheel, with tire, brackets and tools, $100.
Top and Rambler wind-shield, $150.

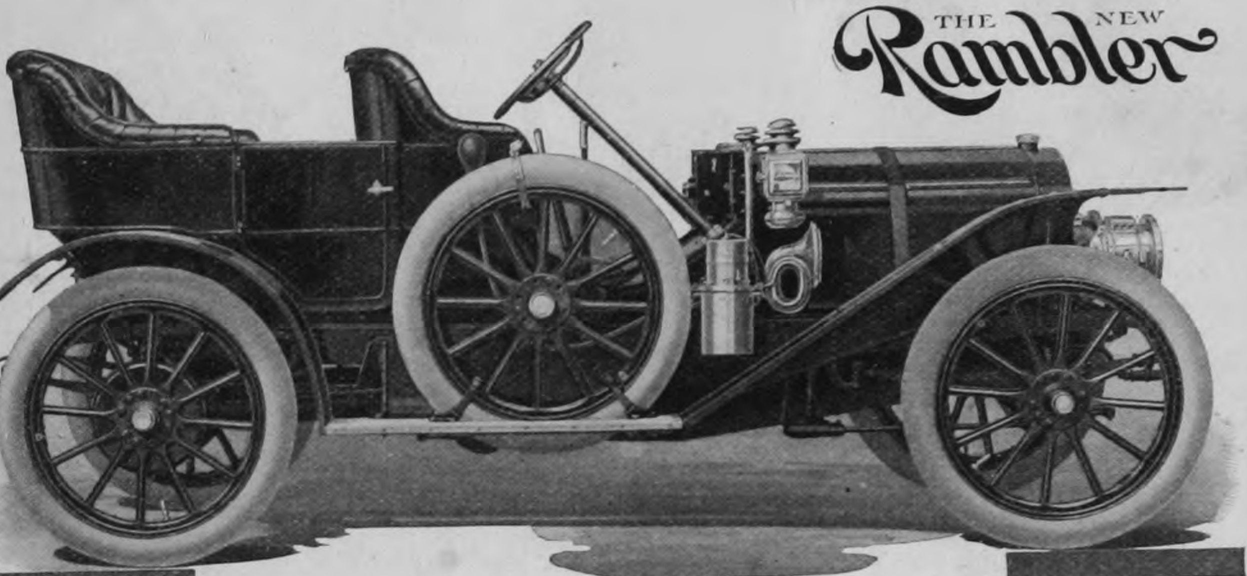
Equipment: Magneto, 6-80 storage battery, two gas head-lamps, electric side-lamps, combination electric and oil tail-lamp, Presto-lite tank, adjustable foot-rest and robe-rail, horn, jack and tools.
Color: Light Brewster green, striped pea green, with cream wheels.

Thomas B. Jeffery & Company

Main Office and Factory, Kenosha, Wis.

Branches and Distributing Agencies:
Chicago, Milwaukee, Boston, Cleveland, San Francisco. Representatives in all leading cities.

THE CAR OF STEADY SERVICE



Model Fifty-three, 34 H. P., $1,800, with Magneto, Lamps and Tools.

MODEL Fifty-three, at $1,800, except for improvements, is identical in quality and power with previous Rambler models which sold at $2,250.

Capacity: Five-passenger.
Engine: Four-cylinder, 4½ x 4½, thirty-four horsepower.
Wheel-base: 108 inches.
Spare wheel with tire, brackets and tools, $75.

Wheels and tires: 36 in. x 3½ in.
Color: Dark Brewster green body with cream wheels.
Equipment: magneto, oil side and tail-lamps, gas head lights and generator, horn, full set of tools and jack.

Model Fifty-four

Model Fifty-four, forty-five horsepower, at $2,250, except for body capacity, is practically a duplicate of Model Fifty-five.

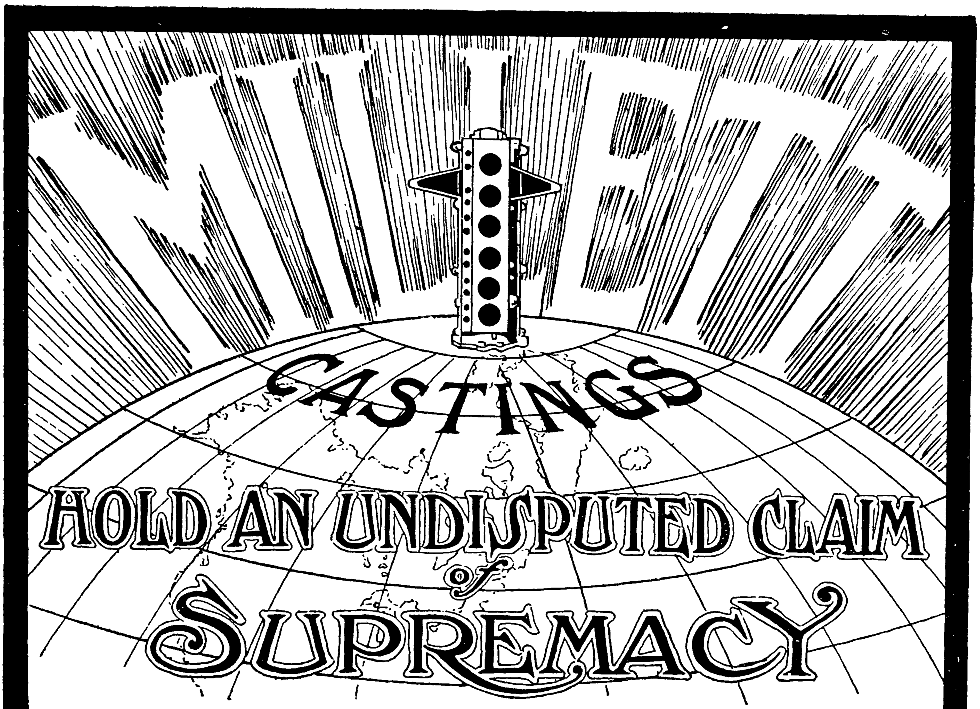
Capacity: Five-passenger.
Engine: Four cylinder, 5 x 5½, forty-five horsepower.
Wheel-base: 117 inches.

Wheels and tires: 36 in. x 4 in.
Color: Light Brewster green and cream wheels.
Equipment: Same as Model Fifty-five.

Thomas B. Jeffery & Company
Main Office and Factory, Kenosha, Wis.

Branches and Distributing Agencies:
Chicago, Milwaukee, Boston, Cleveland, San Francisco. Representatives in all leading cities.

THE CAR OF STEADY SERVICE



¶ We have been compelled to largely increase our facilities for the manufacture of

Millett Castings

and are putting up another large foundry. Why?

¶ Because builders of motor cars have learned by experience that **Millett Castings** are

Unequaled for tensile strength.
Unequaled for smoothness and fineness of grain.
Unequaled for the ease with which they are machined.
Unequaled for the strains of automobile wear and tear.

We are expert workers in

Aluminum, Aluminum Bronze, Manganese Bronze, Bearing Metals and Special Mixtures

Get our quotations. They will prove interesting.

MILLETT BRASS COMPANY

Highland Station, Springfield, Massachusetts

Latest Bulletin

LOWELL, MASS., September 6

BURMAN wins 212-mile Vesper Trophy Race in Remy-Equipped Buick Car. Time—229 minutes, 8 seconds.

CHEVROLET wins 159-mile Yorick Club Trophy Race in Remy-Equipped Buick. Time—176 min., 17 sec.

Other Events Won by Remy-Equipped Cars.

Robert Burman, winner of 100-mile race at New Orleans 100-mile race at Columbus and other big contests in Buick equipped with Remy. He is shown driving at 80 miles an hour

Robert Burman added another triumph to his long list of victories on track and road when he won the 250-mile race at the Indianapolis Motor Speedway on August 19th, creating a new world's record for the first 200 miles in a Buick Car, equipped with the famous Remy Magneto. New Orleans, Daytona, Crown Point (Cobe Trophy Cup) Columbus, Ohio; Lookout Mountain, Indianapolis Motor Speedway—in fact, al the leading motor racing events on circular tracks, tortuous road courses and hills, have furnished new evidences of the greater efficiency of the engine whose spark is furnished by the **never-failing, absolutely reliable, powerful**

Remy High Tension Magneto

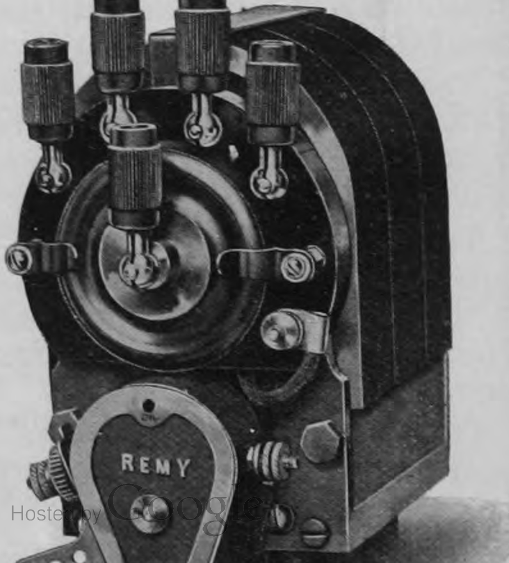
A Perfect Mechanical Ignition System

87,000 Remy Magnetos sold to American motor car manufacturers alone fo the 1910 season—a figure not approached by any other make of magneto. Ou capacity is 1,000 magnetos per day—more than enough to supply the entire moto car industry for the next year. Our factory is the largest fire-proof plant in the world devoted exclusively to the building of mechanical ignition systems.

You can make no mistake in specifying for your 1910 car the **Remy,** the choice of leading manufacturers, racing drivers and dealers.

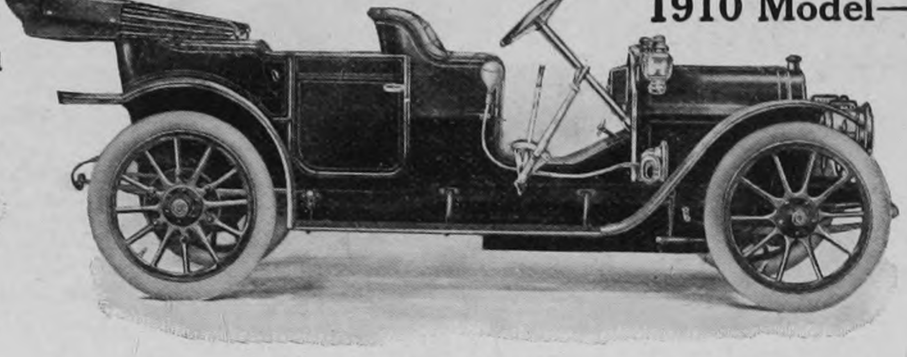
We have contracted with every one of our old customers for 1910, and have added many new ones.

For further information, write, phone or visit our nearest office. (6)



REMY ELECTRIC COMPANY
Dept. 13, Anderson, Ind.
BRANCH SELLING OFFICES:

Touring Car
Pony Tonneau
Roadster
Limousine
Coupe (*Inside Drive*)
Landaulet



1910 Model—$150

The Cars o

The man who takes care to get the most for his money will always choose one of the Chalmers-Detroits.

These cars have not become such a sensation without a good reason behind them.

Last season our orders exceeded our output by $1,200,000. This season, with a largely increased capacity, our whole output was taken by dealers before the first car was delivered. Within six weeks after commencing deliveries, one-third our whole year's output had been sold to users.

Such things do not happen without a good reason. And the reasons, if you look them up, will appeal to you.

This for $1500

The Chalmers-Detroit "30" sells for $1500. These are some of the facts about it:

The wheel base is 115 inches—please mark that. That means plenty of room in the tonneau—all the appearance of a costly car; also easy riding.

The wheels are 34 inches. The engine since last year has been increased in power. The lines are exquisite. There is not a suggestion of cheapness anywhere about the car.

This car has a long-distance speed record of 55.5 miles per hour. This is the car which won the Indiana Trophy. This is the car which made the path-finding trip between Denver and Mexi City. And the car has endurance re ords such as no other car at any pri ever equaled.

We fit our "30" with a Bosch ma neto, a gas tank and two gas lamps f $100 extra. The regular price of the extras is $175.

We add a Lenox mohair top—a reg lar $125 top—for $75 extra. These e tras are sold on the same basis as t cars.

This for $2,750

The Chalmers-Detroit "Forty" se for $2,750, Bosch magneto, gas lam and gas tank included.

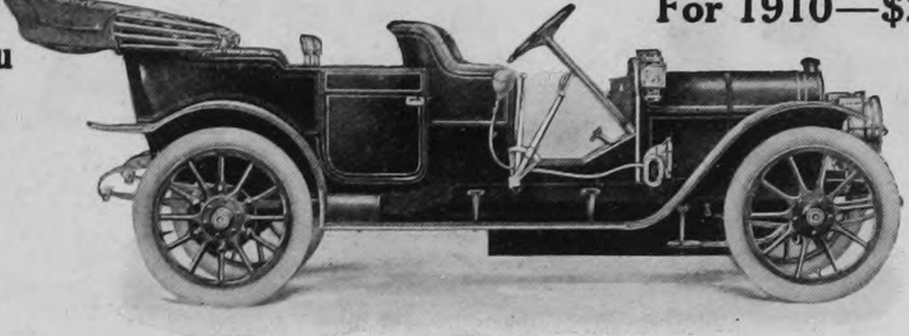
This car has a 122-inch wheel ba and room for seven passengers. T wheels are 36 inches. The upholsteri is hand-buffed leather.

There is nothing in any car at a price to excel it, unless you want e cessive power with its excessive cost upkeep.

No road is too rough for our "Fort no hill too steep, no desirable speed th is beyond its reach.

There was never a car more satisfa tory, as every owner knows. To p more for a car is simple extravaganc No man knows how to make any pa better. We fit this car with a Newpo mohair top—the finest top we can buy for $125 extra. The two extra seats the tonneau cost $75.

ouring Car
ony Tonneau
oadster



For 1910—$2,750

the Careful

The Moderate Price

The question of price is a minor one ompared with the worth of a car. An nferior car is never a cheap car, howver little it costs.

But the Chalmers-Detroits—both the 30" and "Forty"—are Mr. Coffin's degns. And no engineer has a better eputation for designing perfect cars.

There are scores of records, and thounds of owners to tell what these cars ill do.

The reason for the price is the simple ct that we sell on nine per cent profit. he policy of our business is to give the tmost for the money. That is the reaon for our amazing success.

No car selling near the price of our 30" gives what our "30" gives. No r at any price gives more than our Forty." These facts are easily proved a simple comparison, and it is due to ourself that you make them.

Economy in Vogue

Experienced car buyers seek economy ow—not only in cost but in upkeep.

To pay a high price because some aker asks it has come to be known as or business.

To maintain a heavy, over-powered r costs more than most people care to y.

Our "30" has an economy record of .7 miles on one gallon of gasoline.

For the year ending June 1, owners paid us for repair parts just $2.44 per car. Owners who know what some cars cost are seeking such cars as these.

We are selling our $1500 car to some of the wealthiest men in America. We are selling it to engineers with a nationwide reputation. Names will be given when we send you our catalog.

The Chalmers-Detroits are bought by men who know—men who compare—men who have learned by experience. They will be chosen by you if you make the same careful comparisons.

Ask for Catalog

Please write us for catalog which contains all the details, and for name of our nearest agent. Please do this now because our output won't last the season through. And because these cars, with top and side curtains, are comfortable summer and winter. Cut out this coupon as a reminder.

A MEMO TO
Chalmers-Detroit Motor Co., Detroit, Mich.
Please send catalog to

*Name*______________________________

Address ______________________________

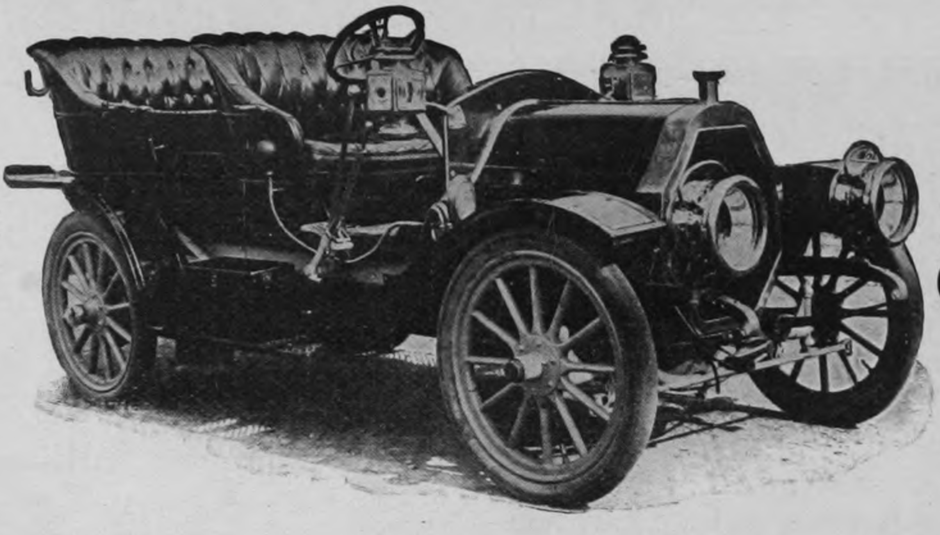
City ______________________________

*County*_______________ *State*_______________

Cycle and Auto Trade Journal

CAR AHEAD!

Weight
1700
lbs.



30 H.P.
(Actual)

RIDER-LEWIS "FOUR"

The Biggest Little Car Ever Built

¶ In design, appearance and ability, the Rider-Lewis IV easily heads the list of popular priced cars.

FEATURES:

Four Cylinders
Valves in the Head
Magneto Ignition
Thermo-Syphon Cooling
32″ x 3½″ Tires

Flexible Motor Supports
Rear Axle Gear Set, 3 Speeds
Straight Line Drive
Light Weight
100″ Wheel Base

Simplicity the Very Keynote of the Design

WE ALSO MANUFACTURE THE EXCELLENT SIX

(The Most Luxurious of Cars), Price, $2500

CATALOG ON REQUEST. AGENTS GET OUR PROPOSITION

Price, $1050

(Fully equipped with Remy Mag-

The Rider-Lewis Motor Car Co.
Anderson, Indiana

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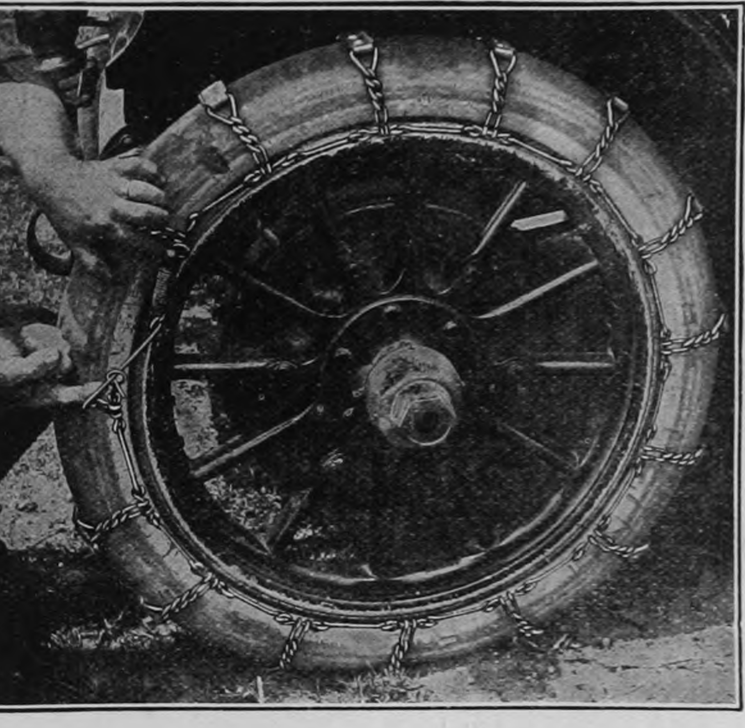
TRAVER NON-SKID DEVICE



Does not cut the Tire

Cannot Skid

Always Fits Snug on the Tire

Outlasts all Others

Does not Cost any more

The secret of the efficiency of the TRAVER NON-SKID DEVICE lies in the spring shown in the illustration. It takes up all otion, and no matter how great the strain on the chain it will always keep its original adjustment.

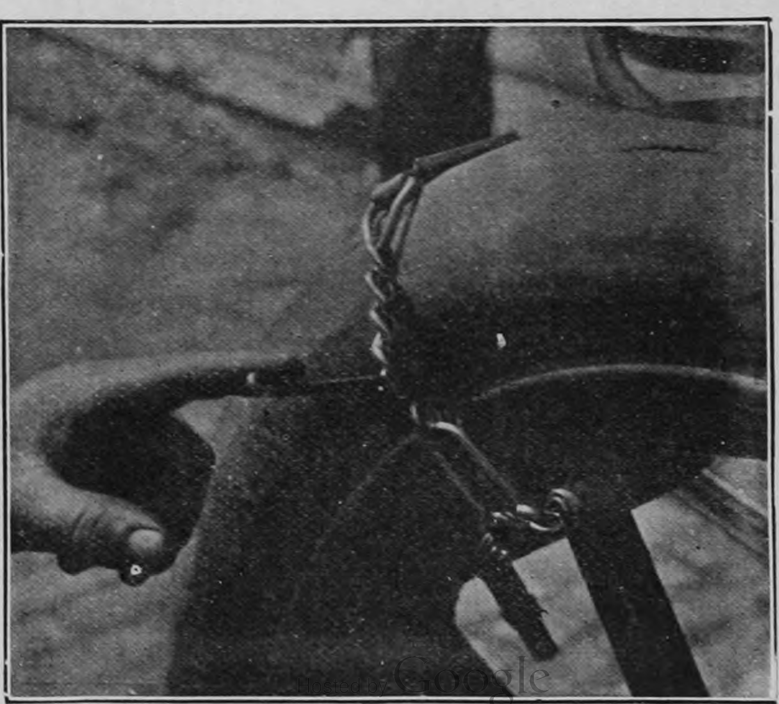
Another good feature is the case-hardened plate system. They have a long wearing rface and are flared at the edges so that no sharp point or edge touches the tire anywhere.

THE TRAVER NON-KID DEVICE may be adjusted quick as a wink."

rice, per set complete, acked in strong canvas ag, from $5.00 to 11.00, depending on ze of tire.

FULLY GUARANTEED

Call to see the TRAVER ON-SKID at your dealer's, or rite for further particulars to



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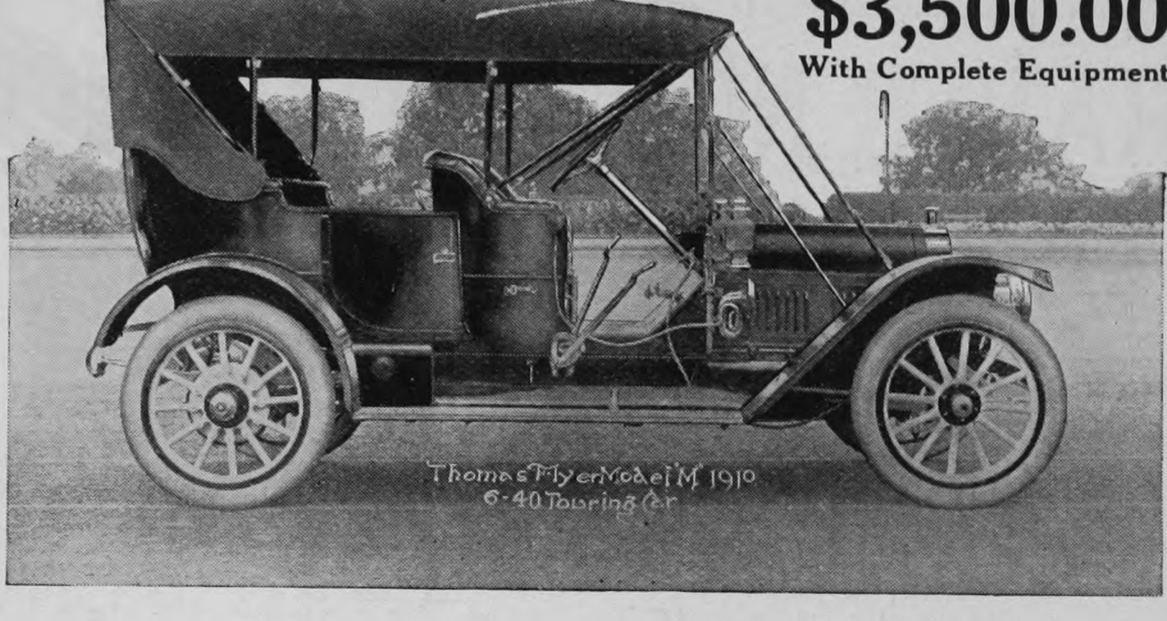
Traver Non Skid Sectional Device

$3,500.00
With Complete Equipment



Every Stroke of this Engine Saves You Money

THE 1910 THOMAS FLYER

Astonishing Price Great Improvement Great Powe

UNRIVALLED PERFORMANCE

Especially Designed and Constructed to Eclipse Competition and Win Absolute Leadership

Experts, Chauffeurs and Automobilists are cordially invited to Investigat the New Candidate for Public Favor.

Six "Long Stroke" Vibrationless Cylinders, Rated at 40 H. P. (4¼" x 5½") Develop 60 Horsepower on the Brake.

Price, $3,500.00; including superb equipment of Silk Mohair Top, Folding Glass Front, Extra Ignition System with Self-Starter, Hartford Shock Absorbers, Speedometer, Prest-O-Lite Tank, Side Dust Aprons and Pan Hand Rail, Two Head Lights, Rear Light, Side Lights, Horn, etc.

THE · THOMAS · FLYER

The Thomas Flyer

E · R · THOMAS MOTOR CO.
BUFFALO · U · S · A ·

Positively No American Car in the 40 to 50 H. P. Class Can Equal Its Splendid Performance, Because

It is the only American Car in its class that is equipped with the New Extra-Silent, Foreign Motor Design, which develops such vastly increased power at same piston speed, viz., Long Stroke Cylinders with very large smoothed gas passages and manifolds, also water jacketed valve stems—the design that has revolutionized motor construction abroad by winning all the 4-inch motor contests, the Grand Prix Race, etc., etc.—and that is also equipped with six cylinders and also has the largest reserve power.

The Following Facts Are Convincing, But A Demonstration is Proof

The "M" Six Cylinder Motor develops 50 H. P. at 1090 R. P. M. and 60 H. P. at 1400 R. P. M., which is 14 per cent. more power than A. L. A. M. rating which is standard.

Many cars run fast enough, but only cars of highest quality can run slow enough on high gear.

Model "M" will run smoothly as slow as Two miles per hour, slower than a man walks, loaded with passengers, amidst the crowded traffic of city streets on high gear without changing. It is safer, easier and a new and most delightful experience and a performance unrivalled. The surest proof of great reserve power, six-cylinder flexibility and highest motor efficiency.

When desired, model M will run slowly on high gear on bad roads and hills that most cars are compelled to run on lower gear or at break-neck and uncomfortable speed to accomplish on high—another strong proof of great reserve power, six cylinder superiority and high motor efficiency.

The same car loaded with passengers, can run 60 miles per hour on country roads—another proof of great reserve power and high motor efficiency.

Model M develops a speed of 20 miles per hour at only 560 R. P. M.—30 miles per hour at 840 R. P. M. —40 miles per hour at 1120 R. P. M., etc., etc. At the same speed, short stroke motors of same bore require 37 per cent. more revolutions; 37 per cent. more jar on bearings; 37 per cent. more vibration; 37 per cent. more wear; 37 per cent. shorter life; 37 per cent. more noise of exhaust and valves; more oil, etc.—another proof of increased motor efficiency, and is proof that there is less vibration, greater silence, smoother running, easier hill climbing and far greater flexibility in the six-cylinder "Long Stroke" motor design.

All the Latest Foreign Models of Most Popular Make, Include 6-Cylinder "Long Stroke" Motors

Model M includes all well-tried improvements of greatest merit, including latest nickel steel, short case transmission gear; extremely simple control; imported ball bearings throughout; short rigid shafts 8 and seven-tenths inches between centers, unusually quiet and strong. Engine has one-piece construction, large diameter crankshaft, can be removed with fly-wheel as a unit; fly-wheel and all rotating mechanism perfectly balanced, both statically and dynamically; valve plungers cushioned for silence; very large water jackets covering valve stems insures against over-heating and sticking; three-point motor suspension; extra large brakes; very long three-quarter elliptic rear silico manganese springs; two universal joints between transmission and clutch, eliminating strain on bearings; the old reliable Thomas three-disc clutch, patented; low center of gravity; 125-inch wheel base; nickel steel drop frames; extra large bearings throughout; long propeller shaft drive; slight angle dust-proof universal joints; geared force feed oiler; forged axles; clearance 11 inches; hand-hammered aluminum body, finest upholstering; wheels and tires 36x4½; workmanship and material guaranteed to be equal to the best.

There is a Reason

The design was begun in 1907 and the construction in 1908 to group in this one car all the well-tried improvements of greatest merit that have been evolved in various popular cars, for the sole and we trust commendable purpose of eclipsing competition and doing the largest business in the 40 to 50 H. P. class, by giving more power, higher efficiency, better results and more for the money in every way. Two years of patient investigation, designing, testing and improving have been required to complete the task, during which we had the great advantage of participating in and winning the 22,000-mile endurance contest around the world, from New York to Paris, a benefit no American competitor enjoys, and also winning thirty-nine other contests and world's records, including the non-stop record of 21 days, 3 hours and 20 minutes on public roads in zero weather; two Glidden Tours (the only ones we entered), also the 180-mile six-cylinder record made at Savannah in 182 minutes and 25 seconds.

In Touring Cars of Larger Power and Size we have the Great Model F 4-60 H. P., an improved New York-to-Paris car, which sells at $4,500.00; and the greatest of all touring cars, 6-70 Model K, fully equipped at $6,000. Model K is equipped with 38-inch tires, also many other improvements. It has the greatest reserve of power of any stock touring car in America, and every owner will back up the statement that the 6-70 Thomas Flyer is the last word in smooth running, hill climbing and all that is good in automobiles.

E. R. THOMAS MOTOR CO., Buffalo, N. Y.

Agents Everywhere
Retail Branches
New York: 63rd Street and Broadway
Boston: 288 Columbus Avenue
Chicago: 1323 Michigan Avenue

E. R. THOMAS MOTOR CO., BUFFALO, N. Y., U. S. A.

Please send me your booklet fully describing the new Model "M" Thomas Flyer, and tell me where I can have the car demonstrated to me.

Name ....

Address ....

....

Nov. Cycle and Auto Trade Journal.

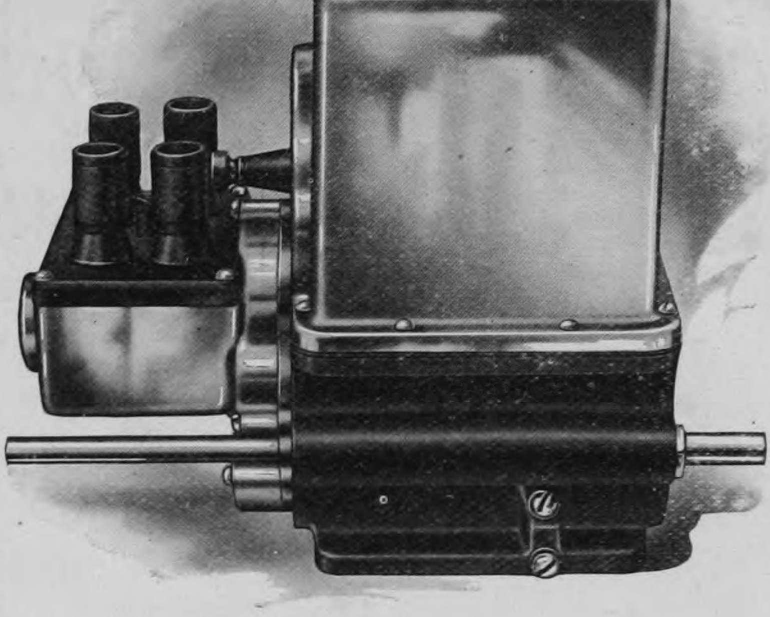
"Straws Show Which Way the Wind Blows"

The following are some of the automobile builders who have the past and this season replaced ball bearings with TIMKEN ROLLER BEARINGS in full or in part in their cars.

Packard Motor Car Co.
Pierce-Arrow Motor Car Co.
The F. B. Stearns Co.
Locomobile Co. of America
American Locomotive Co.
Lozier Motor Co.
Stevens-Duryea Co.
Welch Motor Car Co.
Mathewson Motor Car Co.
National Motor Vehicle Co.
Premier Motor Mfg. Co.
Cadillac Motor Car Co.
E. M. F. Co.
Moon Motor Car Co.
Marion Motor Car Co.
Lexington Motor Car Co.
Moline Automobile Co.
Herreshoff Motor Co.
Mason Automobile Co.
Grout Automobile Co.
Anderson Electric Co.
Babcock Electric Carriage Co.
Waverly Co.
C. P. Kimball & Co.
Atlas Motor Car Co.

The Timken Roller Bearing Company
Canton, Ohio

WICO
GNITER



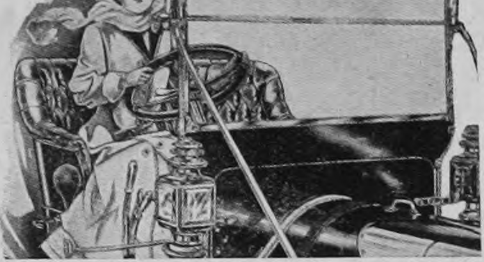
Start your motor from the seat as on a battery and coil, shift your gears without speeding up and without fear of killing your engine, negotiate a steep grade without headway, or drive as slowly as you like through traffic in high—if your car is equipped with a Wico Igniter.

This revolutionizing improvement in ignition, furnishing an inexhaustible supply of electricity, absolutely independent of engine speed, costs you but sixty dollars for the four-cylinder type and fifty dollars for the two-cylinder type.

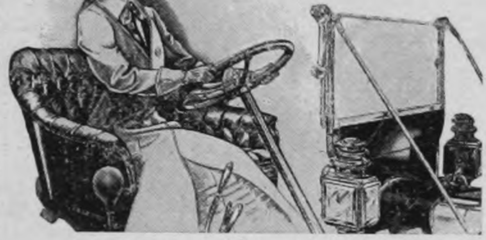
You owe it to yourself to cut out maintenance expense on ignition and enjoy the faultless service of this remarkable device.

WITHERBEE IGNITER COMPANY

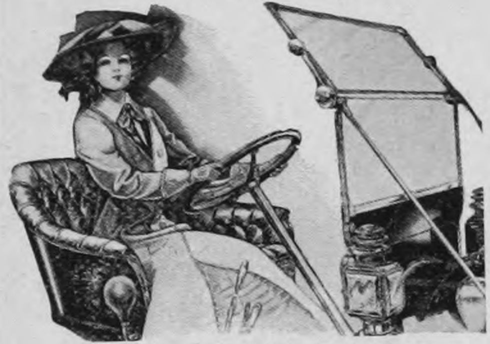
PRINGFIELD
ASSACHUSETTS
BRANCHES:
NEW YORK: 1876 Broadway
CHICAGO: 1429 Michigan Avenue
DETROIT: 220 Jefferson Avenue



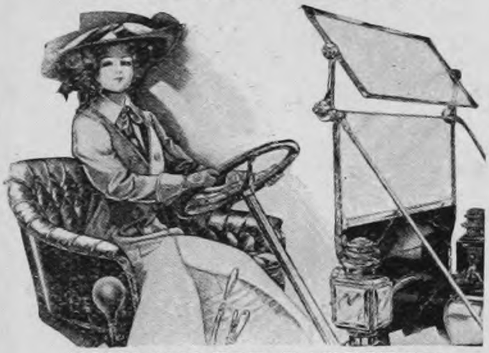
IN ELEVATED POSITION



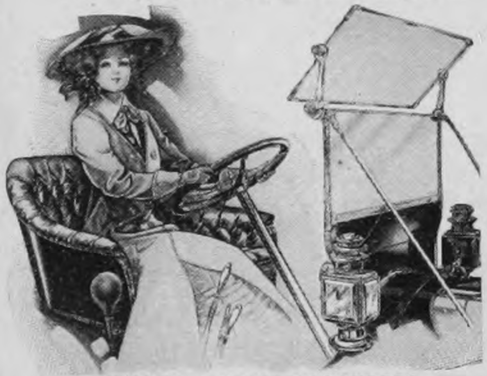
IN FOLDED POSITION



IN THE TILTING POSITION



POSITION FOR RAIN VIEW



VENTILATOR POSITION

TROY

SEXTETTE AUTOMATIC WIND SHIELDS

SIX :: POSITIONS :: SIX

¶ AUTOMATICALLY acquired. NO THUMB SCREWS. All the mechanism concealed. You simply shove the upper sash into the position desired. It locks of its own accord, AND THE LOCK IS POSITIVE. Crucible Steel Spiral Springs in the Fixtures keep the parts in contact always on a tension. Hence an honest NON-RATTLER.

TRADE MARK

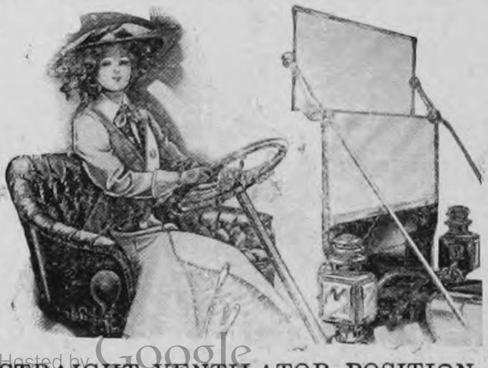
THE FAMOUS
TROY
LINE

TWELVE :: MODELS :: TWELVE

LEADS THEM ALL

IN STYLE AND QUALITY
QUICK SHIPMENTS
LOW PRICES

DON'T
FAIL
TO
WRITE
TODAY
FOR BIG
CATALOG

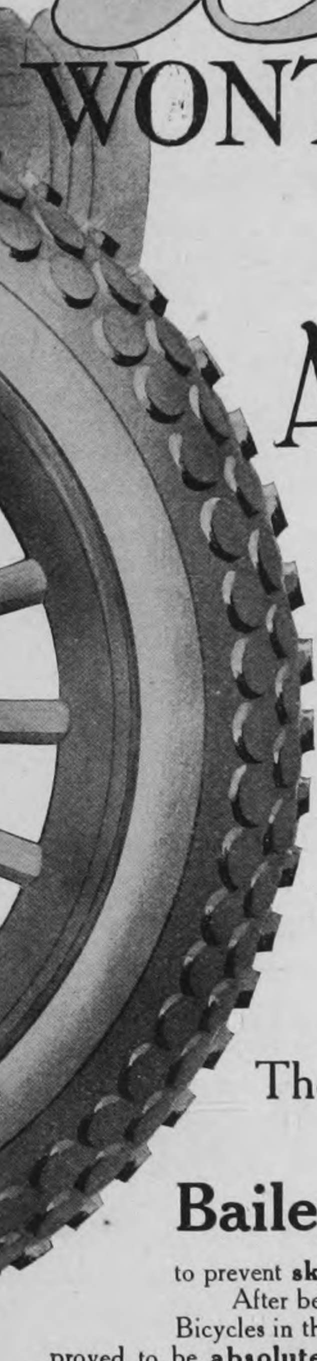


STRAIGHT VENTILATOR POSITION

The Bailey

WONT SLIP TREAD

is to the AUTOMOBILE What the RUDDER is to the SHIP



The rubber studs forming the

Bailey "Won't Slip" Tread Tires

to prevent **skidding** and give perfect **traction** were the **correct principle** to start with.

After being in general use for over eight years on Automobiles, Motor Cycles and Bicycles in the United States and Europe, the principle of the BAILEY TREAD has proved to be **absolutely correct.**

Twelve of the largest **tire** manufacturers in the world (nine in the United States and three in Europe) endorse this as licensees under the patents to make and sell the BAILEY TREAD.

In fact, the principle is so **perfect** that it is **impossible** to produce a substitute.

For sale by all dealers throughout the world. Write us for descriptive booklet.

C. J. BAILEY & CO., Patentees, 22 Boylston Street, Boston, Mass.

N. B.—The extra cost of the BAILEY TIRES on the List more than smooth of same make is 2½ and 3 in., $1.50 each; 3½ in., $2.00 each; 4 in., $2.50 each; 4½ in., $3.00 each; 5 in., $3.75 each.

LICENSED MANUFACTURERS—in the United States

THE B. F. GOODRICH CO., Akron, Ohio
THE DIAMOND RUBBER CO., Akron, Ohio
THE FISK RUBBER CO., Chicopee Falls, Mass
HARTFORD RUBBER WORKS CO., Hartford, Conn.
G & J TIRE CO., Indianapolis, Ind.
GOODYEAR TIRE & RUBBER CO., Akron, Ohio
MORGAN & WRIGHT, Detroit, Mich.
EMPIRE AUTOMOBILE TIRE CO., Trenton, N. J.
CONSOLIDATED RUBBER TIRE CO., New York City

"If It's Made by H-E-I-N-Z-E It's Right"

SPECIFY

Heinze New Low Tension Magneto

ON YOUR 1910 CAR

and get the one that the best posted Ignition Experts have decided is superior to all others, whether of American or Foreign make.

SUPERIOR IN EFFICIENCY
SUPERIOR IN CONSTRUCTION
SUPERIOR IN OPERATION

Note This Important Feature!!!

Will produce perfect Ignition at 50 revolutions crank shaft speed.

The superiority of Heinze Coils made for us a reputation second to none in the Ignition field and with that reputation to sustain we offer you in the

New Heinze Magneto

absolutely the

MOST RELIABLE
MOST DURABLE
MOST EFFICIENT

Ignition Apparatus that it is possible to produce.

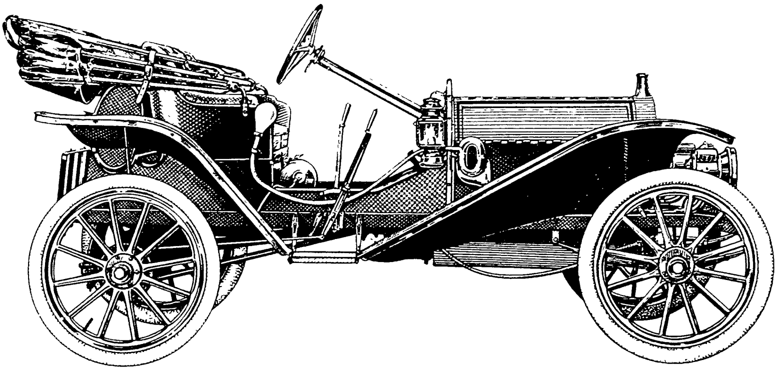
Whether you are the owner of one car or the manufacturer of ten thousand cars, you cannot afford not to investigate our claims.

We issue an elegant loose-leaf catalog which we will send upon request, if you will address DESK 10.

HEINZE ELECTRIC COMPANY

Factory and Main Office: LOWELL, MASS.

EVERYTHING THE BIG CAR HAS SAVE SIZE



Hupmobile

4 cylinders
20 H. P.
Sliding gears
Bosch Magneto

$750

Until the Hupmobile came, nobody had built a little car which was just as good as the best big car made.

The man who bought a roadster or runabout knew that he wasn't getting the same sort of engineering skill, workmanship and material that he got in the fine large cars.

But the Hupmobile has changed all that.

If the makers of the best and costliest big cars in the country decided to market a moderate priced roadster, they wouldn't produce a better car than the Hupmobile—because they couldn't.

SPECIFICATIONS

ENGINE—4 cyl., 20 H. P., 3¼ in. bore, 3⅜ in. stroke; water cooled; offset crank shaft; fan bladed fly wheel in front; Parsons white bronze bearings; noiseless cam shaft.
TRANSMISSION—Selective sliding gears, shifting without noise.
CLUTCH—Multiple disc type, running in oil.
REAR AXLE—Shaft drive.
BRAKES — Two foot and two emergency (internal expanding) lined with Thermoid on rear hubs.
IGNITION—Bosch high tension magneto.
TIRES—30x3 inches.
WHEEL BASE—86 inches.
TREAD—56 inches.
SPRINGS—Semi-elliptical front, patented cross spring rear.
EQUIPMENT—Two side and tail oil lamps, dragon horn, tools, repair kit, pump.
WEIGHT—1100 pounds, regular equipment.

Their pride in their fine workmanship is no greater than our pride in ours.

What they give you on a large scale the Hupmobile gives you on a small scale.

It isn't a little car masquerading as a big one.

It's a small car which is just as good in every detail as the best big one.

The power plant is just as perfect.

It's not as large as some others, but if you examine it with the experienced eye of a critical engineer you won't find it one whit inferior.

It will do the utmost that a perfect power plant can do in proportion to its size.

Its 20 horse-power is not mythical—the full 20 horsepower is there whenever and wherever you want or need it.

It's a perfect little glutton for hills and high grades. You can't discourage it anymore than you can discourage the finest other motor of twice the horse power rating.

And what's true of the motor is true of every other feature in the construction.

You'll search in vain for anything inferior—for any one part in the chassis that doesn't match the same part in a costlier car in everything but size.

Where will you see a sturdier, strong, pressed steel frame, stauncher axles (fit for a car twice its weight), or a more noiseless system of sliding gears?

And what other roadster compares with it in snap, style and elegance of appearance—what big car, speaking proportionately, is more distinguished?

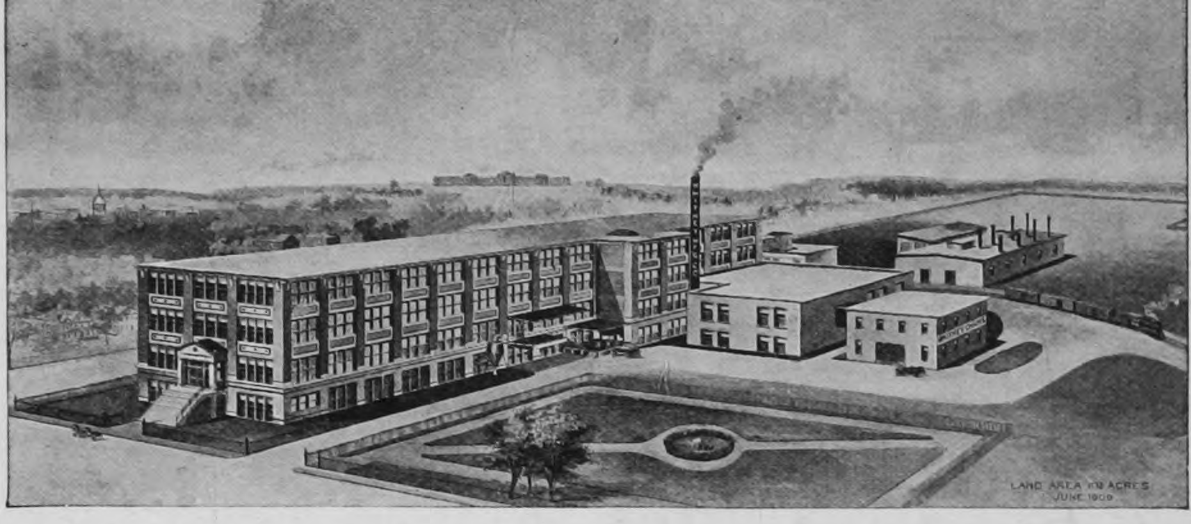
Success has come to the Hupmobile in overflowing measure. In every community it has hosts of friends and its appearance on the streets is followed by a chorus of admiring comments.

Ask your Hupmobile dealer to demonstrate its splendid speed, power and smooth running capacities and you'll be charmed with its performance.

And write for the literature.

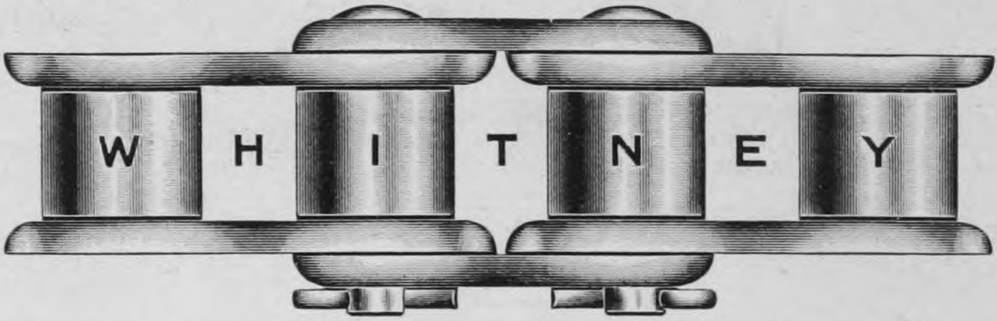
Hupp Motor Car Company

DEPT. A **DETROIT, MICHIGAN**



"Whitney" Chains

"WHITNEY" CHAINS are made in a modern fireproof factory and are used by the Leading American Makers of commercial and pleasure cars. A list of the cars driven by "WHITNEY" CHAINS will be furnished on application.



¶ The "Whitney" Patent Cotter Detachable Chain has made for itself a record which no other Detachable type has approached. It is favorably known from the Atlantic to the Pacific by jobbers, dealers and users. In an emergency a nail, wire or ordinary steel cotter can be used as a substitute for our special phosphor bronze cotter pins, but it would be difficult to find a substitute for any detachable locking device of special design.

THE WHITNEY MFG. CO.

Standard Six

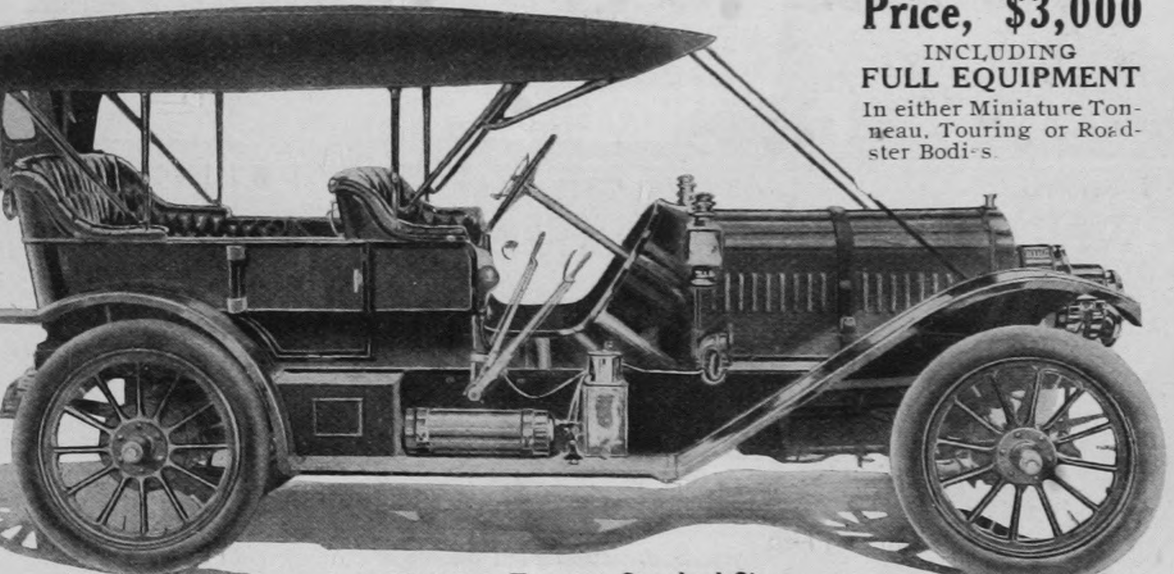
The Car Complete

50 H. P., Shaft Drive, 124-Inch Wheel Base, Dual System Ignition,
Remy Magneto and Dry Cells.

Silent—Powerful—Swift

4 to 65 Miles Per Hour on High Gear.
Wheels on All Stock Cars equipped with Quick Detachable Rims.

Price, $3,000
INCLUDING
FULL EQUIPMENT
In either Miniature Tonneau, Touring or Roadster Bodies.



Miniature Tonneau Standard Six

THE VERY BEST VALUE FOR THE OUTLAY

he purchaser of a motor car should look for the very best value for the outlay. There are many cars f varying degrees of worth. Some cars are dear at any price. Others of greater and more pronounced alue are reasonable at three to four times the price of low-priced cars.

LARGE PLANS OF MANUFACTURING

ave enabled us to divide with the purchaser, previous profits on so excellent a car as the STANDARD IX. The motoring public has taken to this car as naturally as a duck to water. We have aimed to build nd are building one of the Best Six Cylinder cars in America—a car of classy lines and with that Dash hat makes the STANDARD SIX wanted by every prospective purchaser who looks it over or rides in it.

THE SPLENDID CONTINUITY OF POWER IN THE STANDARD SIX

s an impelling force which impresses every lover of a motor car, and that to own a STANDARD SIX ould be the height of his ambition.

WE WILL EXHIBIT AT NATIONAL AUTOMOBILE SHOW AT ATLANTA, GA.,
NOVEMBER 6 TO 13, SPACE 21.

SEND FOR OUR HANDSOME 12-PAGE FOLDER, GIVING FULL DETAILS.

AGENTS WANTED IN TERRITORY NOT ALREADY ALLOTTED.

AUTOMOBILE DEPARTMENT:

ST. LOUIS CAR COMPANY

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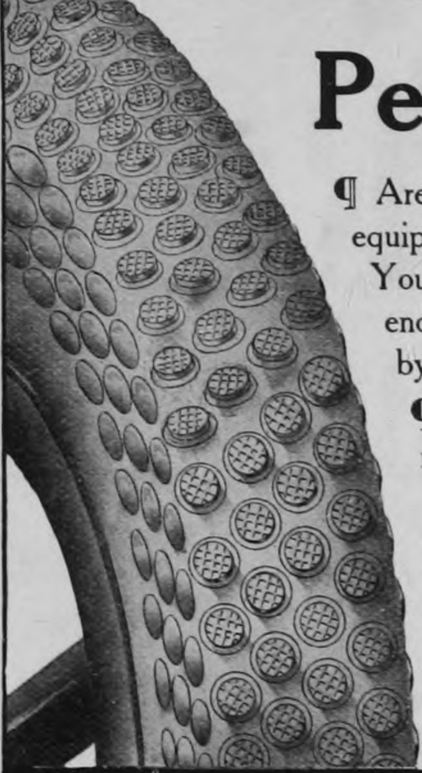


Perfect Tire Scores

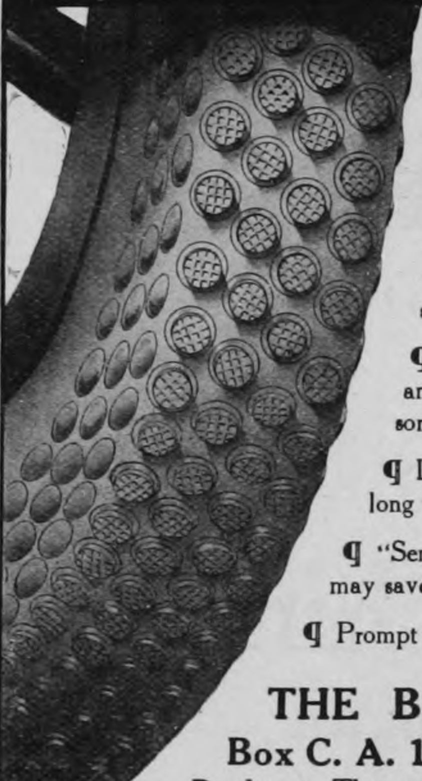
¶ Are not an impossibility—no, sir! Not if your tires are equipped with BRICTSON DETACHABLE TREADS. You may take any test—city touring, cross country runs, endurance tests, one and all—and you forearm your safety by using Brictson Treads.

¶ The result is as sure as that the sun will rise tomorrow.

¶ There is not a chance for puncture, for blow-out, for skidding—when your tires are encased with Brictson Treads.

¶ No chance for you to endanger your life, or the lives of your fellow passengers. Insure safety by using this, the tested tire protector.

BRICTSON
DETACHABLE
TREAD



¶ There is no occasion to use chains or carry extra tires when you have safe-guarded the life of your tires and insured the certain going of your car.

¶ Each tire Brictson equipped grips firmly the road-bed. No matter how slippery or how jagged it may be. It fairly bites into the road surface. It adds impetus to the speed of your car. You will find by a thorough test that the Brictson Tread increases instead of retarding the speed.

¶ You owe it to your personal comfort, to the life of your tires, and to the great saving effected to right now equip your tires with Brictson Treads.

¶ Long enough have they gone unprotected. Now is the time to prolong their life by acting. Simply write to-day and say:

¶ "Send your booklet 'The Enemy of Tire Expense,' and tell me how I may save my tires and decrease my monthly tire bills."

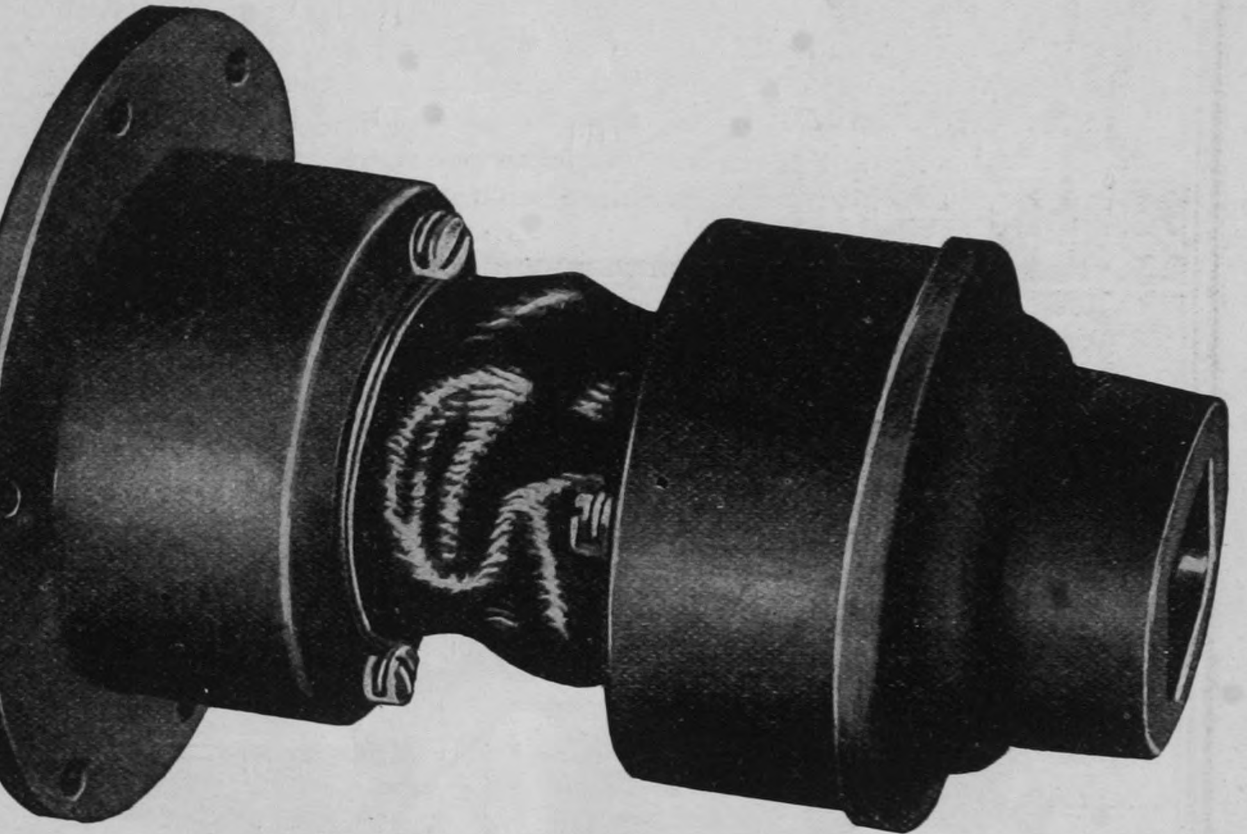
¶ Prompt attention to all inquiries—prompt filling of all orders.

THE BRICTSON MANUFACTURING CO.

Box C. A. 11 **BROOKINGS, S. D.**

Dealers:—The supply man who doesn't carry Brictson Detachable Treads is—well

BLOOD BROS.
UNIVERSAL JOINTS



Style J, Double

¶ Only one of many patterns. We have both Single and Double

Blood Bros. Machine Co.

Kalamazoo, Michigan

"The Best car ever made at the price, and as good as any, whatever the price"

TRADE **KLINE KAR** MARK

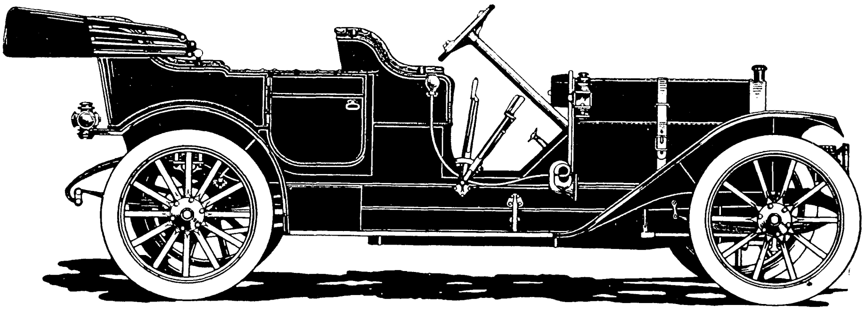
THE KLINE KAR has "arrived." It has taken its place unhesitatingly among the leaders. Since the first announcement of this wonderful car we have received hundreds of letters, telegrams and personal calls from agents all over the country, eager to handle the KLINE KAR.

This instant popularity is due to our specifications and price in a large measure; but also to the reputation of the designer of the KLINE KAR, Mr. J. A. Kline, whose past success as builder of the "Pullman" is too well-known to require comment. In the KLINE KAR are embodied all the fruits of his many years' experience. Well-informed buyers know this. That's why the KLINE KAR is making good so quickly. It's the best to sell and the best to buy.

Did you ever hear of a high-grade output, either with a new or old name, making good so quickly?

Pleasure and Commercial Cars for All Purposes
Write for detailed information

"A New Car by an Old Designer"



Model 6-40, 40-50 H. P., 6 Cylinder, 5 Passenger Touring Car, **$2,500**

MANUFACTURED BY
BCK MOTOR CAR CO.,
YORK, PA.

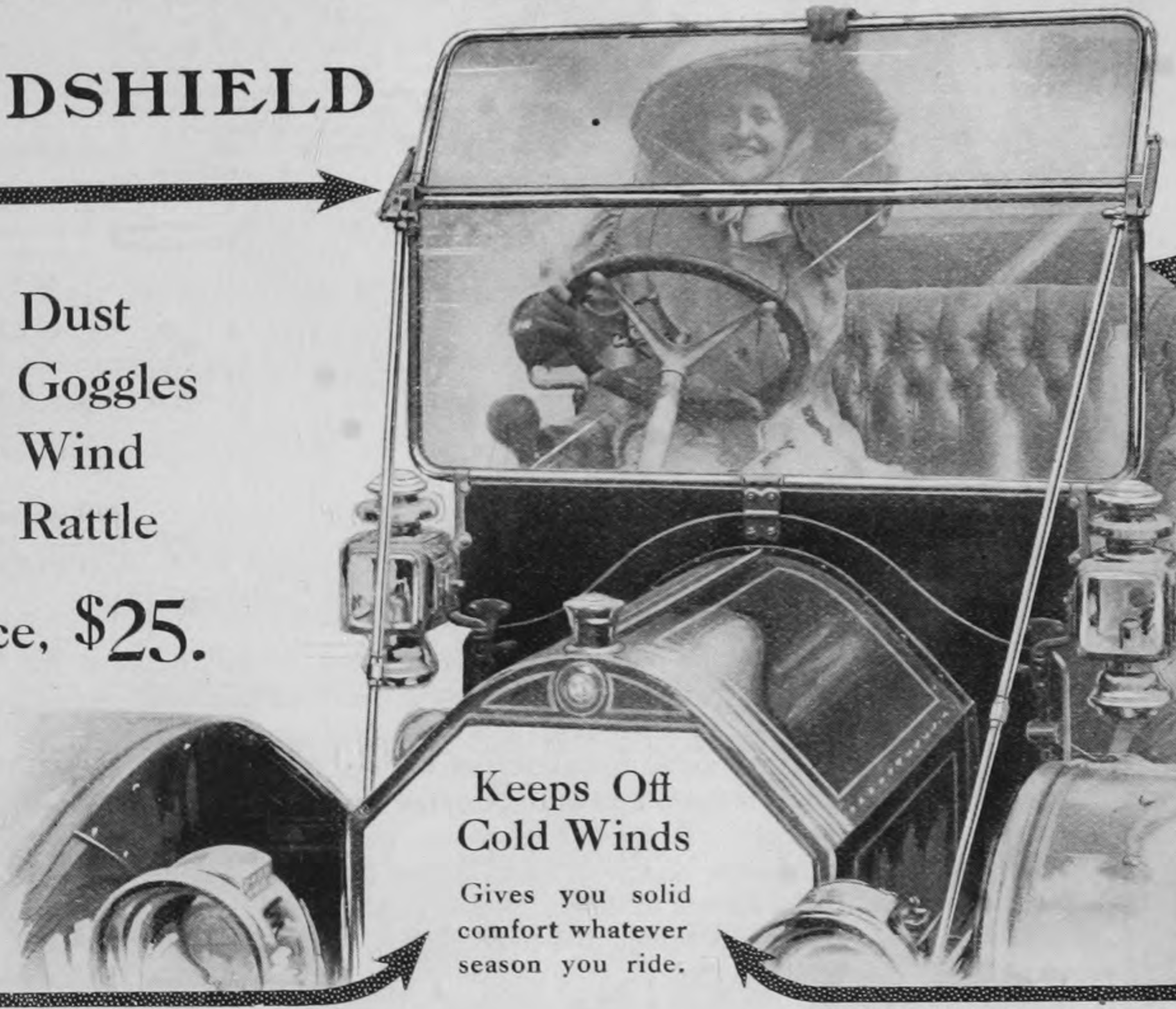
Write Dept. A for Information, Territory and Prices

Automatic

NDSHIELD

No Dust
No Goggles
No Wind
No Rattle

Price, **$25.**



Keeps Off Cold Winds

Gives you solid comfort whatever season you ride.

p or down with one hand without Stopping your car

With the Mezger Automatic Windshield there are no set-screws tinker with. You simply lift it up and it locks itself upright rigid. When you want it down, a slight pull with one hand puts down against the rubber bumpers where it rests—firm, noiseless. is always ready and always works.

The Automatic is made of finest polished French plate glass and ass tubing. The glass rests against heavy piano felt inside a bronze annel—free from the vibrating and jolting of the car.

The name, Mezger Automatic, is on every Automatic Windield. If your dealer will not supply you, we will ship on receipt of price. 41-inch—$25; 44-inch—$27.50.

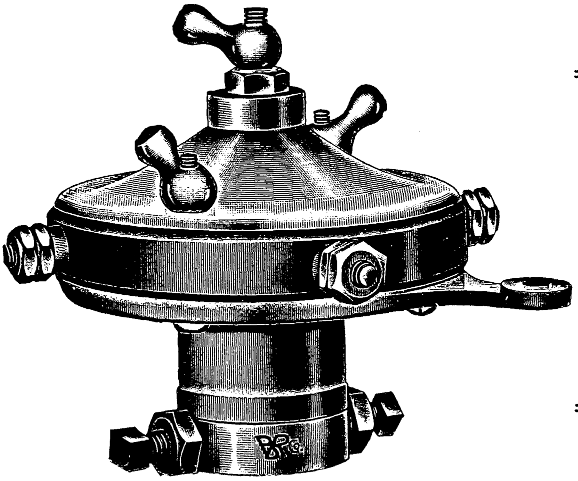
The MAXIMUS Makes Motors Mote

Over 12,000 satisfied users. If you are not one of them,
you should be; they save your temper, time and money.

PATENTED JUNE 2, 1908

More Speed

More Power



Less Plug Trouble

Less Coil Trouble

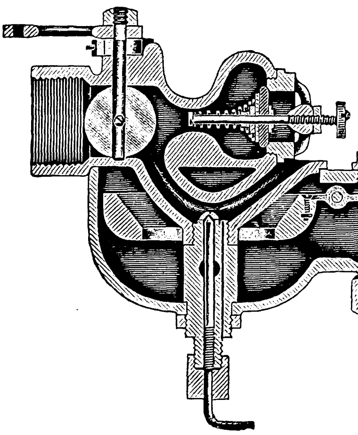
THE "MAXIMUS" TIMER

We know we have the best timer made, and that it will improve the speed power and smooth-running qualities of your motor; if it does not, your money will be refunded without argument. 85 per cent. of 1908 model machines are equipped with roller type timers. The Maximus is constructed on the principle of the best of these, but has several improved features that overcome the weak points of roller-type timers, and make the motor mote. A special Maximus, designed to be easily applied to 2-cylinder Buick and Models M and N Ford is now ready for delivery.

The unprecedented success of the Maximus Timer encouraged us to experiment in carburetion, and, after careful testing and improving, we are now ready to offer

The MAXIMUS CARBURETOR

Simplified Carburetion



List Price

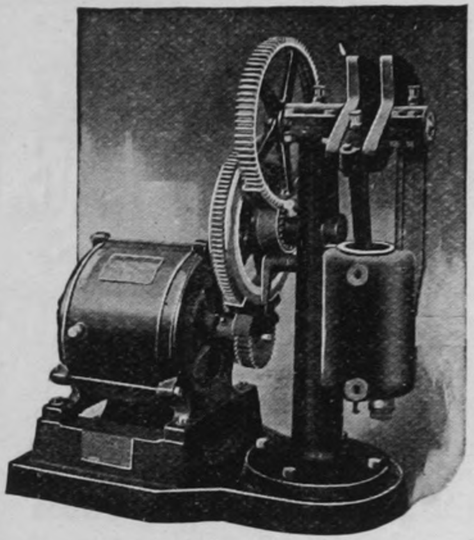
1-inch Size, $11.00
1½-inch Size, $12.00

The principal feature is the improved method of applying both the constant and compensating air The small opening for the constant air creates a strong vacuum on the nozzle, resulting in throttling to very slow speed and ease in starting. The method of applying the compensating air does away with the sudden increased rush of air on the spray nozzle at change of throttle.

MADE BY

The BECKLEY RALSTON CO., 80-82-84 Michigan Avenue, CHICAGO, ILL.

AIR COMPRESSORS

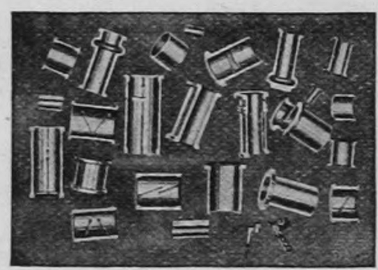


BELTED—MOTOR DRIVEN

Single and Three Cylinder Styles.

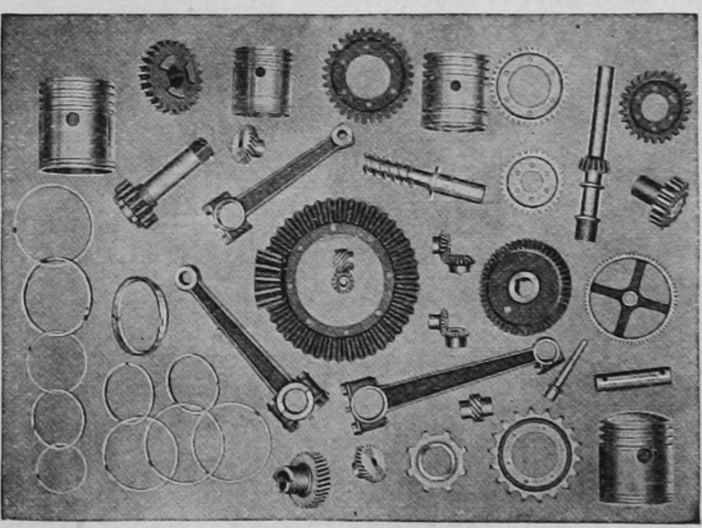
All modern garages use them for inflating tires, cleaning cushions, etc

A compressor designed for hard and continuous service.



Finished Die-Cast Bearing Bushings made to specification.

Let us submit estimates based on your specifications and blue prints.



Let us make your automobile and motor machine parts, like those shown in the cut.

We can make them better and cheaper, and and give you prompt deliveries.

Generated Gears of every description.

THE F. W. SPACKE MACHINE CO.

INDIANAPOLIS, IND., U. S. A.

AUTOMOBILE PARTS

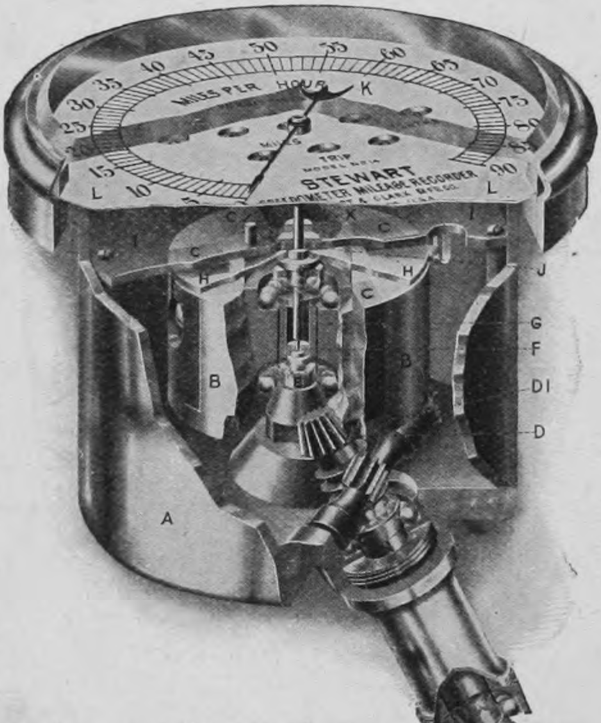
EASIEST TO READ

THE STEWART MULTIPOLAR

Has a scale three times the length of any other

With this long, open scale, and with figures evenly spaced, the driver soon learns the position of the different mileage figures and can instantly tell the speed by the angle of the pointer just the same as he tells time by his watch—he does not read the figures, he knows by the position of the hands just what time it is.

This feature is of great importance, as the usefulness of a speedometer at high speed is very slight unless it can be quickly and accurately read.


10
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60
65
70
75
80
85
90
MILES PER HOUR
K
MILES
TRIP
STEWART
SPEEDOMETER MILEAGE RECORDER
STEWART & CLARK MFG. CO.
L
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A

This is not possible where the scale is short or must be read through a small aperture, or where the figures are unevenly spaced.

The Stewart Multipolar

Is the one speedometer properly designed to give efficient service from every standpoint.

SEND FOR CATALOG

STEWART & CLARK

MFG. CO.

Stewart Multipolar

The New Leader Wind Shield

"Safety Requires, Above All, an Unbreakable Frame"

COLONEL SPRAGUE'S NEW AIR CUSHIONED "LEADER" WIND SHIELD

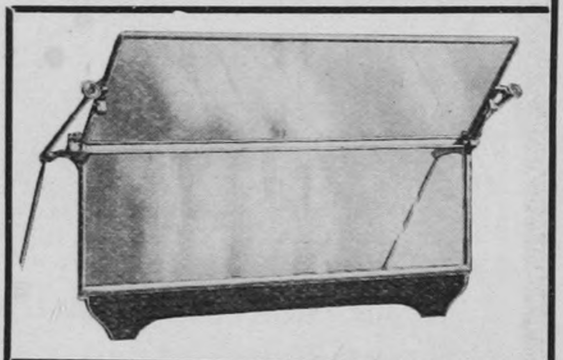
as an unbreakable frame, and is as automatic as good mechanical ense and safety will allow.

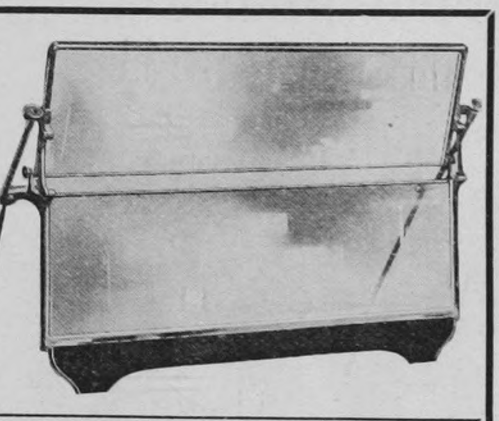
The New "Leader" is the result of nine years' consistent rogress in making wind shields of the highest class.

WHY BUY?

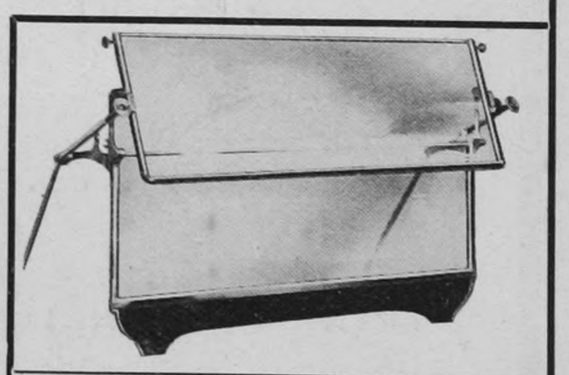
Because It Has Many Exclusive Features

No other shield can be rigidly held n four positions: upright or closed; own or folded; tilted back to give ir to the back seat; carried forward o as to make a clear space between he upper and lower sash, so you an see your way in foggy weather.


TILTED BACK—AIR TO BACK SEAT


TILTED FORWARD—CLEAR VISION

No other shield has an Air Cushioned Locking Device. Ours works easily and positively, and holds the shield rigid in each of the above positions. It cannot get out of order.


DOUBLE HINGE—FOLDING

No other shield s made with lower sash moulding triding the filler board, that is atached to the dash, thus preventing ts warping.

No other shield has a combined double and single hinge which may be used together or independently, so as to miss any steering wheel.

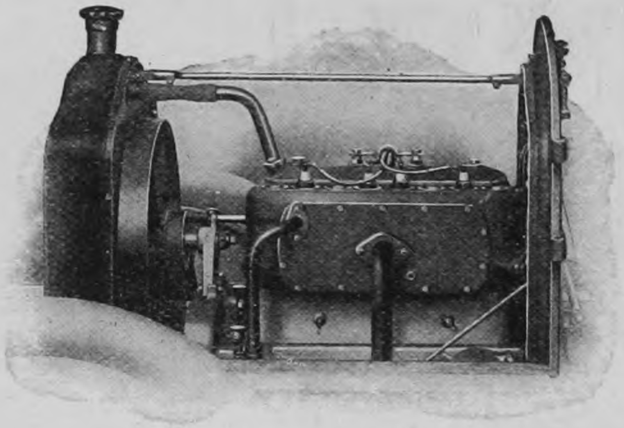
No other shield has a wood filled tubing to which curtain buttons may be attached.

Ask for our Catalogue and Price List

The Sprague Umbrella Co.

THE WHITE GASOLINE CAR

Is in a Class by Itself

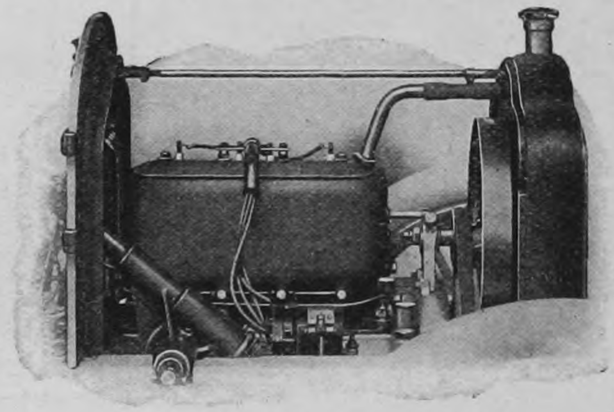

Left Side of White Gasoline Engine

THE White gasoline car embodies a number of desirable features which are not found in any other American car. These features are by no means experimental, but have been adopted for the 1909-1910 models of the leading foreign makes. For example, the White has a "long stroke" motor, which recent experience has shown to be by far the most satisfactory, giving increased power, higher economy and greater efficiency.

¶ Then note carefully in the accompanying illustrations, the extreme simplicity and neatness of the engine. No other American car has an engine so free from complications.

¶ Another distinctive feature of the White gasoline car is that it has a four-speed transmission. This feature has hitherto been found only in cars of very much higher price. As is well-known, a four-speed transmission is as much superior to a three-speed transmission as the latter is to a two-speed transmission.

¶ If you are planning to buy a gasoline car, why not get the very latest in construction. You can find it only in the White gasoline car at $2,000, or in the 1910 foreign cars at double the White price.


Right Side of White Gasoline Engine

Write for Descriptive Circular

THE WHITE COMPANY

860 East 79th Street

CLEVELAND

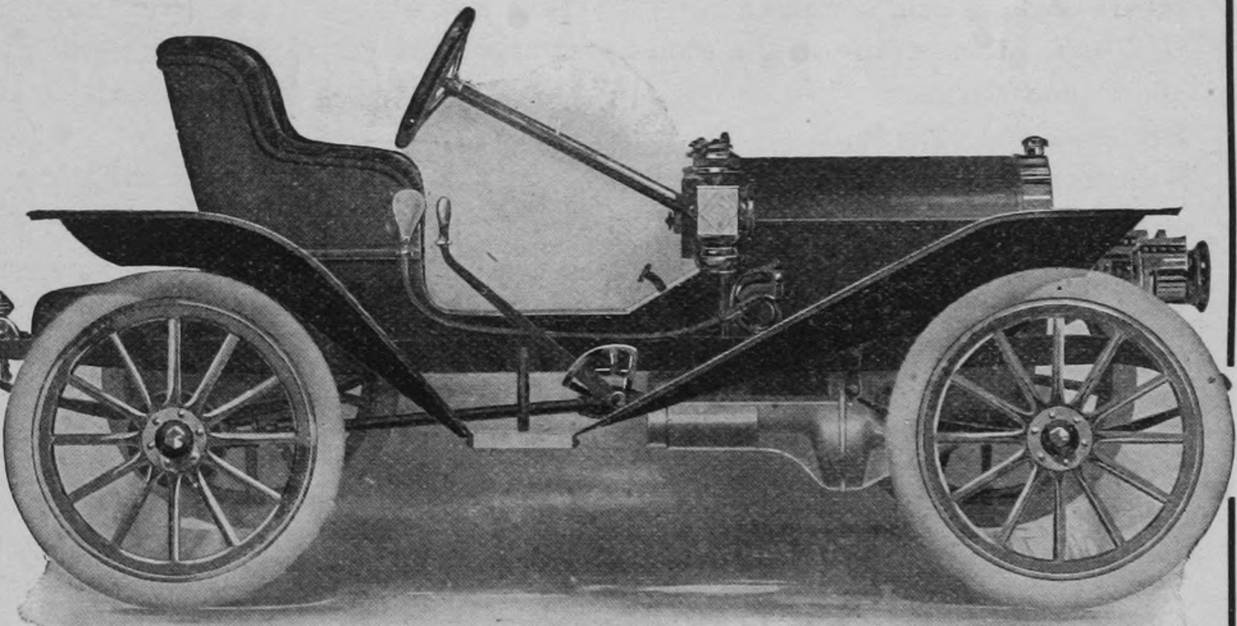
New York City, Broadway at 62d St.
Boston, 320 Newbury St.
Philadelphia, 629-33 N. Broad St.

Atlanta, 120-122 Marietta St.
Chicago, 240 Michigan Ave.

HERE IT IS

"DEMŌT"

All of the best features of the high-priced cars embodied in a runabout at a price within reach of all.



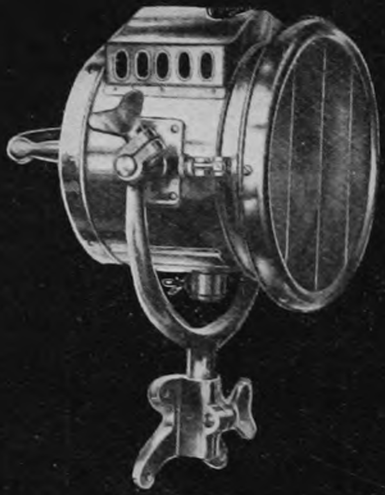
$550—Magneto Included

Write for Agency Proposition

DEMOTCAR SALES CO.
Distributers
45 State Street

Demotcar Company
Manufacturers

DIETZ



"Majestic" Searchlights

"A good searchlight is a good reason"

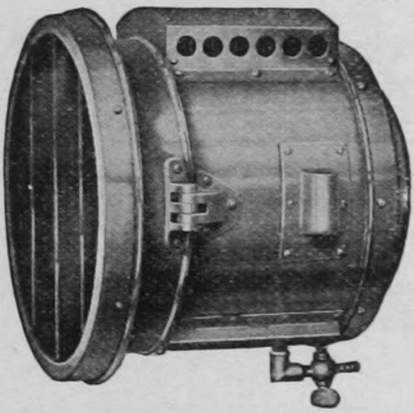
for enjoyable night riding on country roads.

¶ The Dietz new model "Majestic" is made in 5 sizes of lenses, 5″ to 9″ dia., and has a sweeping radius of beam both horizontal and vertical. Well-made, handsome by daylight; in short, designed

FOR SUPERIOR CARS

SEND FOR OUR MOTOR CAR LAMP CATALOG

IMPLICITY=DIGNITY=TRUE WORTH



"Who ever heard of Queen Alexandra changing the shape of her hat?" Thus queried lately a French critic, contrasting the simplicity of cultured taste with the shifting monstrosities of modern modes.

Who ever heard of a true artist taking liberties with his subject? The Thing Which Is, Endures; the Thing Which Is Not, passes away.

RUSHMORE SEARCHLIGHTS

are optically the best, mechanically the strongest and most durable in the world. Their outward form is the fit and dignified expression of their inward worth.

RUSHMORE DYNAMO WORKS

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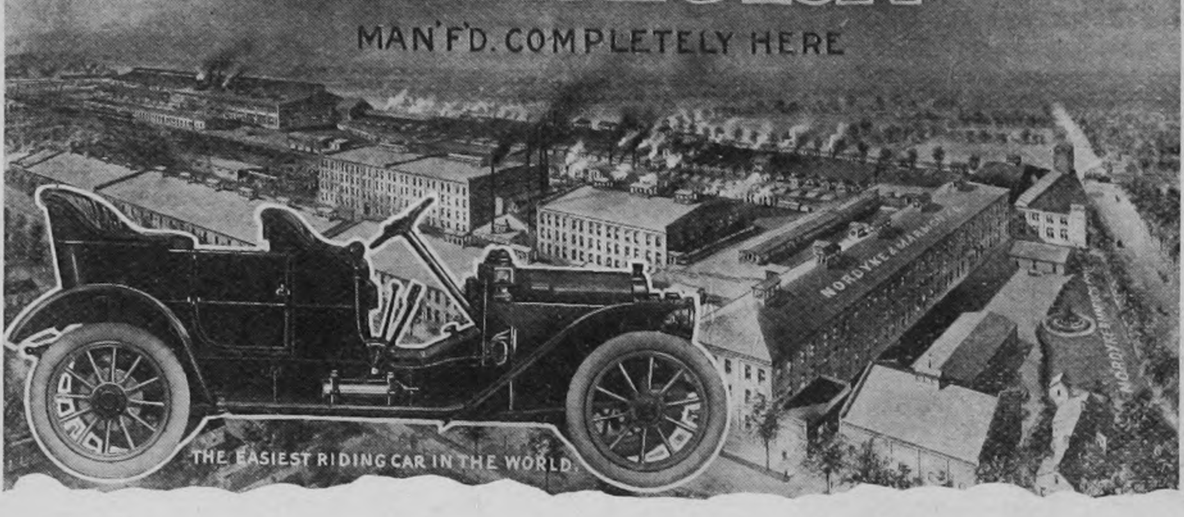
THE MARMON


MAN'F'D. COMPLETELY HERE
NORDYKE & MARMON CO.
THE EASIEST RIDING CAR IN THE WORLD.

Worth—Present and Future

The experienced buyer of motor cars no longer questions the wisdom of buying a *manufactured* car. He knows that a price—high or low—does not establish the real character of any assembled car.

In making his choice between cars which he *knows* are manufactured cars, he should consider both the *kind* of manufacture and the *stability* of the maker, because a motor car has a future as well as a present.

The factory behind the Marmon car has had over fifty years' experience in the manufacture of high-grade machinery. Its product has a well-established reputation in every quarter of the civilized world.

It is easy to see why the Marmon should be exactly what it is—a car of marked mechanical perfection, sound, careful construction and great durability.

The abundant value in the "Thirty-two" is readily apparent to anyone who knows the kind of design, materials, workmanship and equipment that distinguish a really high-grade car.

From every standpoint, it is the safe choice for any perplexed buyer.

Price, Complete {Touring Car, Suburban or Roadster} $2650

SPECIFICATIONS——Motor, four cyl., 4½x5, 32-40 H. P., water cooled, with Mercedes type honeycomb radiator. **Ignition,** Imported Bosch H. T. Magneto and battery, dual system. **Lubrication,** Marmon system of automatic force feed through hollow crankshaft. **Drive,** straight line shaft. Selective transmission and floating rear axle one compact unit. Large durable brakes, easy adjustment. **Materials,** absolutely the best of everything, including Krupp, Vanadium and Chrome Nickel steels, Imported Hess-Bright bearings. Schwarz wheels. **Tires,** 34x4, Q. D. Marsh Rims. **Wheel Base,** 116 inches. Weight (Touring Car), 2300 lbs. **Bodies,** all metal, cast aluminum base with cast aluminum doors and door frames. **Equipment,** complete and highest grade.

DEALERS who wish to figure on an agency for the best, moderate-priced, high-class car, should write us at once. Promised deliveries easily made good.

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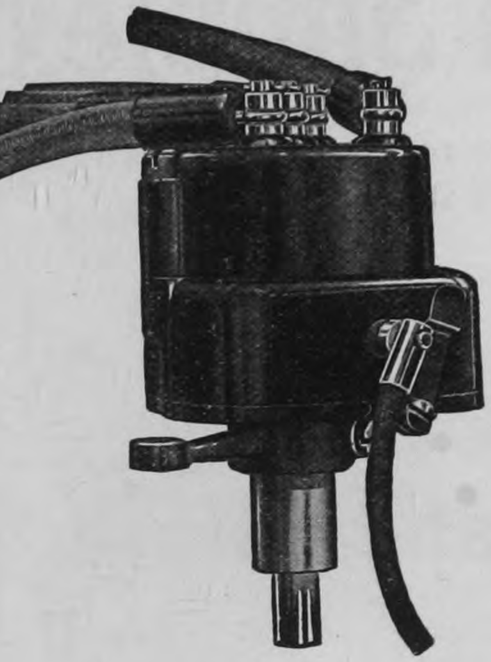
Coil Troubles?



Avoid them by using a Unisparker

BATTERY renewals are the least of the troubles saved by its use. Platinum renewals, trembler adjustments, overhauling and replacement of the timer, and the troubles due to poor coil con-ruction—all these are eliminated, together with the annoyance and xpense they entail.

¶ Storage batteries, an irksome necessity with four or six unit coils, are uperfluous with the UNISPARKER, with which six dry cells outlast wo or three times the storage battery's ordinary mileage.

¶ Along with the economy of batteries and repairs, the UNISPARKER ives greater power than the vibrator coil, due to its perfect synchronism nd unlimited speed range.

¶ We explain other advantages in our catalogue.

ATWATER KENT MFG. WORKS

TWO MORE BIG

AJAX TIRE

TRIUMPHS!

1,282 Miles on the Munsey Run with only One Puncture

READ THIS TELEGRAM:

Washington, D. C., Sept. 30.

Horace De Lisser,
President AJAX-GRIEB RUBBER CO., N. Y.

Want to congratulate you on best tire record in Munsey Run. I had one puncture on AJAX TIRES on entire run.

H. F. Walls, Driver Official Car (Maxwell).

In the Class 5 event of the

LONG ISLAND STOCK CAR DERBY

on the Riverhead-Mattituck course, Sept. 29th, Arthur See, in a Maxwell, won, driving 91 miles in 101 minutes 22 seconds, at the rate of 54 miles an hour. Thomas Costello, in a Maxwell, was second, and Doorly, in a Maxwell, was fourth —all three cars equipped with AJAX TIRES.

All twelve tires were in excellent condition at the finish of the race. These were the same tires on which the three cars were driven from the Maxwell factory at Tarrytown, N. Y., and on which the practice trials, before the race, took place. Not only were they not changed for the contest, but after the race was over the same tires carried the three cars back to the factory.

Not a puncture, not a blow-out, no re-pumping of air—no tire trouble of any kind whatsoever.

No Other Tire in the World Has Ever Equalled This Record!

AJAX TIRES are Guaranteed for 5,000 Miles or 200 Days' Service. Write for a copy of the Guarantee.

AJAX-GRIEB RUBBER COMPANY

General Offices: 1777 Broadway, New York

Factories: Trenton, N. J.

BRANCHES:

Philadelphia, 316 N. Broad St.
Boston, 15 Park Square
Detroit, 743 Woodward Ave.
Denver, 1529 Cleveland Place
Seattle, 1102 Broadway

Portland, Ore., 142 Nineteenth St.
San Francisco, 438 Market St.
New York City
57th St. & Broadway
Milwaukee Agents, Goodyear Rubber Co.

Los Angeles, 1038 So. Main St.
Chicago, 1425 Michigan Avenue
Minneapolis, 905 First Ave., So.
Kansas City, 1422 Grand Ave.
St. Louis Agents, Goodyear Rubber Co.

We will exhibit at the Atlanta Automobile Show, November 6-13, 1909

From Ocean to Ocean

The Military Mitchell car which left New York, August 19, bearing a dispatch to General Weston, of California, arrived in San Francisco September 19.

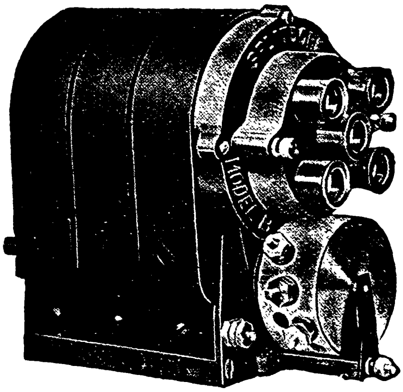
This car was equipped with a

SPLITDORF MAGNETO

which during the entire trip gave the same faultless ignition for which it is so noted.

It is just such strenuous tests as this that prove to the utmost what a Magneto is made of.

It is a matter of record that the SPLITDORF Magneto has made good in every great run and race in which it has been used.



MODEL B MAGNETO

Chicago: 319 Michigan Avenue
San Francisco: 520 Van Ness Avenue
Detroit: 868 Woodward Avenue
Boston: Motor Mart

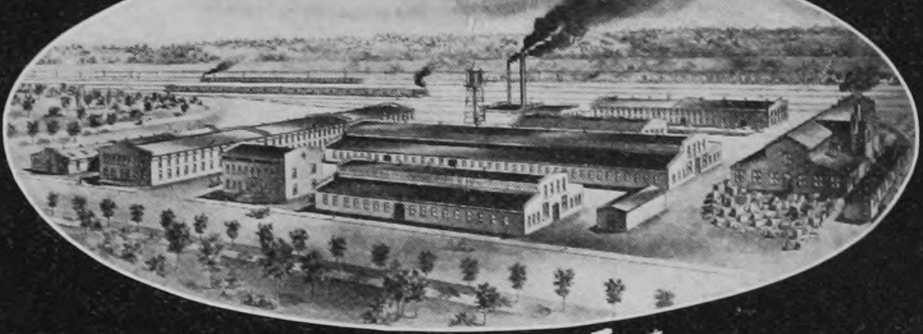
It's demonstrated Efficiency and Reliability are the only reasons why so many discriminating motorists are equipping their cars with SPLITDORF Magnetos.

Why not equip your car likewise and have the same superior ignition? Ask for Magneto catalog.

C. F. SPLITDORF

Walton Ave. and 138th St.
Branch, 1679 Broadway
NEW YORK

London Paris Turin Brussels Barcelona Johannesburg



Forced to Build a Bigger Factory

Since the remarkable record achieved by the Moline in the recent Glidden Tour, orders have been pouring in so fast we have been forced to add another big building, covering 600,000 sq. feet of additional floor space, to our already mammoth plant.

¶ The public were quick to recognize the exceptionally sterling qualities of the 1910

Moline

The Perfect Score Car

¶ And why not? When or where has any car demonstrated such high-class qualities, even at double the selling price of the Moline?

¶ The Moline has proved *decisively* it is no longer necessary to pay $3,000 to $4,000 for a car that will respond to *every demand* of the average driver.

¶ It covered the 2640 miles (15 days' run) over all sorts of roads without a single replacement, not even a fender bolt—finishing with a *perfect road score.*

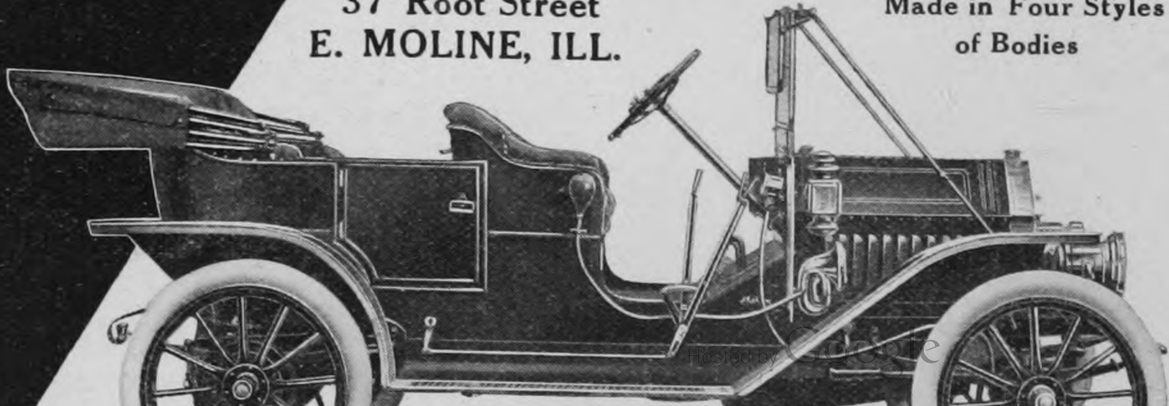
WRITE FOR OUR NEW BOOK No. 37

¶ Let us mail you "The Story of the Glidden Tour"—a beautiful, interesting illustrated book, just off the press, giving some very valuable buying information. A post card will bring it, postpaid.

MOLINE AUTOMOBILE COMPANY

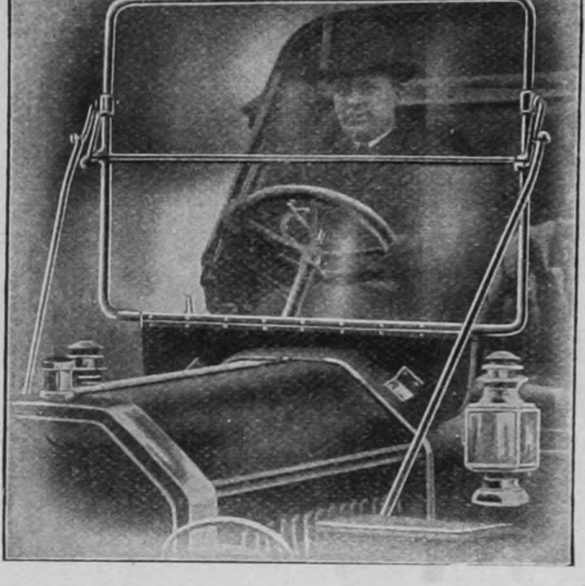
37 Root Street
E. MOLINE, ILL.

Made in Four Styles of Bodies



Automatic

The "ACKERMAN" Wind Shield



Patent Pending

A handsome addition to any car, as the entire frame is made of brass, and only the best plate glass is used. It is absolutely rigid, up or down, and may be changed without slackening the speed of the car. Get our prices. The "Ackerman" will prove a money maker for the dealer, for it's an easy seller.

Automobile Mountings

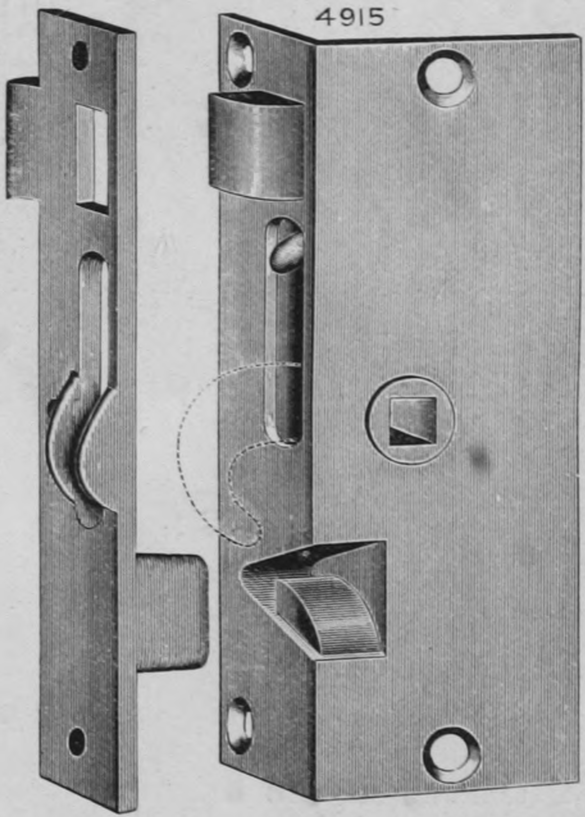
for 1910

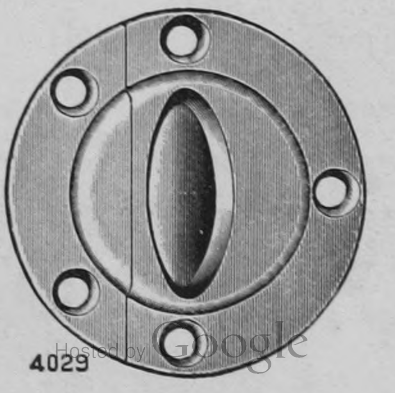
We have a full line of the trimmings that add tone to an automobile. Our locks are the kind that always work smoothly; our handles are ornamental, yet strong and durable. The coat and robe rails we make are the best of their kind, and so on, down the entire list, which includes:—

- Malleable Coach Hinges
- Brass Coach Hinges
- Lamp Brackets
- Foot Rests (Folding)
- Hood Handles
- Curtain Fasteners
- Footman Loops
- Tire Holders
- Strap Loops
- Body or Grab Handles
- Side Door Handles
- Dash Moldings
- Running Board Moldings
- Carpet Binding
- Bow Separators
- Bow Rests
- Hood Hinges
- Deck Rails
- Continuous Hinges
- Side Door Locks
- Automatic Hook Locks
- Finishing Bolts
- Wind Shields (Ackerman)
- Finishing Screws
- Washers and many other useful articles.

We are supplying the largest and most exclusive makers. We know we can please you and that our prices will be satisfactory. Send specifications for estimate on your requirements.

4915





4029

The "Know-It-Alls"

said derisively, "That patent is no good," but Judge Hough, of the United States Circuit Court, says:

> **" This Statement of complainants' position seems to show that the subject matter of these suits is the modern gasoline automobile." "If I have correctly apprehended it, there was clearly room for a pioneer patent, and it must now be held that on its face and in view of the art, Selden's is such a patent." "If these defendants infringe, it is because complainants own a patent so fundamental and far-reaching, as to cover every modern car, driven by any form of petroleum vapor, and as yet commercially successful." " It is so found, and decrees will pass accordingly."**

Don't let the "Wiseacres" fool you any longer. The "Selden Patent" is not air, it is **substance,** and its validity is recognized by the United States Patent Office and the Courts.

Now, listen! If Mr. Geo. B. Selden was the original **inventor** of the automobile—of a vehicle propelled by a gasoline engine, under power produced by hydro-carbon internal combustion—as these highest authorities broadly admit, can any rational man believe

THE SELDEN CAR

MADE BY THE FATHER OF THEM ALL

of today would be permitted by Mr. Selden to be anything but the **best** in material and in correct and careful mechanical construction? Such a supposition is absurd. This is not stated at all as a defensive argument, but as a simple fact which may not have occurred to some minds. The makers of the SELDEN car have nothing to apologize for. The car has a splendid record and speaks for itself, and the many hundreds of owners throughout the country are praising it in a chorus which reaches from coast to coast. Ask any Selden owner and he will confirm this statement.

The Selden car has not figured conspicuously in spectacular "races" and similar "contests," it is true. We have never cared much to risk life and limb for the transitory glory of a race track "win." But the Selden car, built for comfortable riding and thorough service, has done innumerable "stunts," and amazing ones, in the way of hill climbing and long and difficult tours, which have not been heralded by paid press agents, and many owners of cars made by the "wiseacres" have been too dizzy and dust-blinded to identify the Selden car when it passed them on the road!

Our output—from our new factory—will be more than doubled for 1910. The greater part of this product has already been contracted for, but there are still some good unoccupied centers where we would like to secure desirable agencies.

There will be five models, Touring Car (five passenger and seven passenger), Torpedo Tonneau, Roadster and Limousine, at prices ranging from $2,000 to $3,000—the lowest prices, we believe, consistent with high-grade cars of the Selden quality.

SELDEN MOTOR VEHICLE CO.

GEORGE B. SELDEN, President

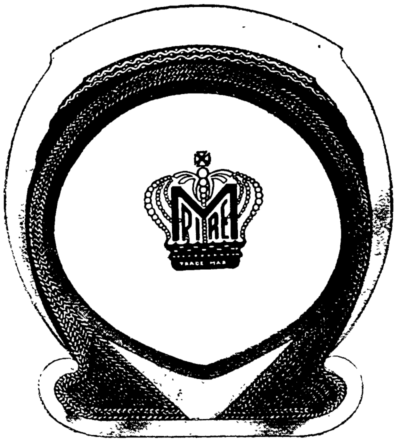
ROCHESTER, N. Y.

Members of the Association of Licensed Automobile Manufacturers

Licensed under Selden Patent

Empire Tires

WEAR LONGEST



SEE US at the Atlanta Show!

EMPIRE TIRE COMPANY

FACTORY, TRENTON, NEW JERSEY, U. S. A.

BRANCHES

Boston—292 Devonshire St.
Chicago—1305 Michigan Ave.
Detroit—842 Woodward Ave.
Newark—264 Halsey St.
New York—73d St. & Broadway; 148 Chambers St.
Philadelphia—322 N. Broad St.

AGENCIES

ATLANTA—EMPIRE TIRE SALES CO.
Atlantic City—Penn Auto Supply Co.
Buffalo—Empire Sales Co.
Boise, Idaho—Randall Dodd Auto Co.
Cleveland, O.—Motor Supply Agency Co.
Dallas, Texas—Southwestern Auto Supply Co.
Denver, Col.—Denver Auto Goods Co.
Jacksonville, Fla.—Savell Rubber Co.
Kansas City, Mo.—Auto Specialty Co.
Los Angeles, Cal.—Empire Tire and Rubber Co.
Minneapolis, Minn.—Empire Tire and Rubber Co.
New Orleans, La.—H. A. Testard.
Norfolk, Va.—Wm. H. Grover.
Pittsburg, Pa.—Consumers' Auto Supply Co.
Portland, Me.—James Bailey Co.
Providence, R. I.—Waite Auto Supply Co.
San Francisco, Cal.—H. W. Bogen, Inc.
Savannah, Ga.—Harris Tire Co.
St. Louis, Mo.—Gorman Bros.
Syracuse, N. Y.—Central City Rubber Co.
Toledo, O.—W. G. Nagel Electric Co.

Atlas
TWO CYCLE
MOTOR CARS

Taxicabs are now in use by more than twenty-five companies through the United States.

The leading companies in New York, Chicago, St. Louis and many smaller cities are now successfully operating Atlas cabs.

The simple Atlas two-cycle, two-cylinder engine with five moving, non-adjustable, indestructible parts has successfully solved the power problem.

The Taxicab requires an engine of peculiar construction, so simple that it is almost impossible for it to get out of order, economical in fuel consumption, flexible in control, and fool proof.

Other requirements are a maximum amount of body room with a minimum amount of mechanism and extreme durability.

Atlas Taxicabs combine all of these features in a greater degree than any other taxicab built.

Write us for further information regarding Atlas Taxicabs, and why the two-cycle engine is ideal for this type of car.

With the catalog we will send a list of users.

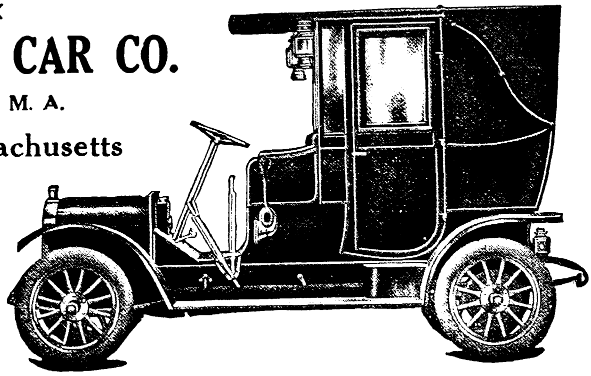
ATLAS MOTOR CAR CO.

Members A. M. C. M. A.

Springfield, Massachusetts

New York Office:
1924 Broadway

Fred H. Adams, Manager



The Autocar

Established 1895

The Leading British Motor-Car Paper

Established in advance of all others and still far ahead of them all

Profusely Illustrated

¶ 'The Autocar" provides, week by week, an interesting and authoritative review of the progress of automobilism in the United Kingdom, and should be read by every progressive maker and dealer, who "knows how" to benefit by the experience of others.

Subscription Rates

	United States and Foreign Countries		Canada	
Twelve Months - - -	22	8	17	6
Six " - - -	11	4	8	9

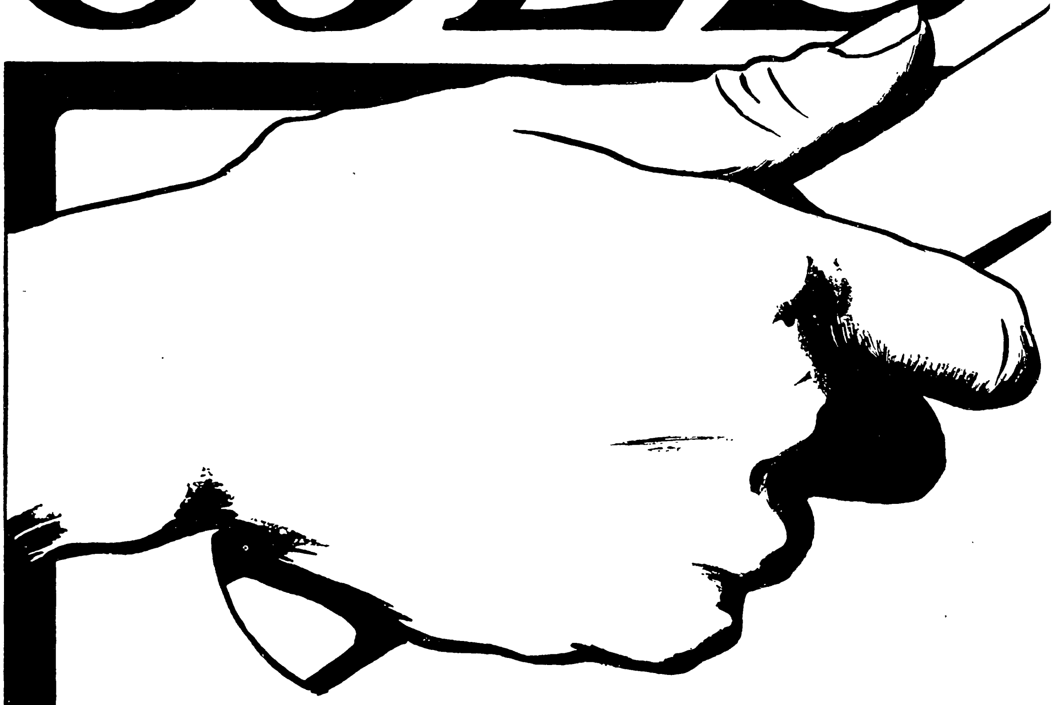
P. O. Order to be made payable to "The Autocar"

¶ American manufacturers of motor vehicles and accessories who wish to expand their business should look to the British Isles. The market is a rich one and by advertising in "The Autocar" it is possible to reach the entire BUYING section of the public which is interested in automobilism.

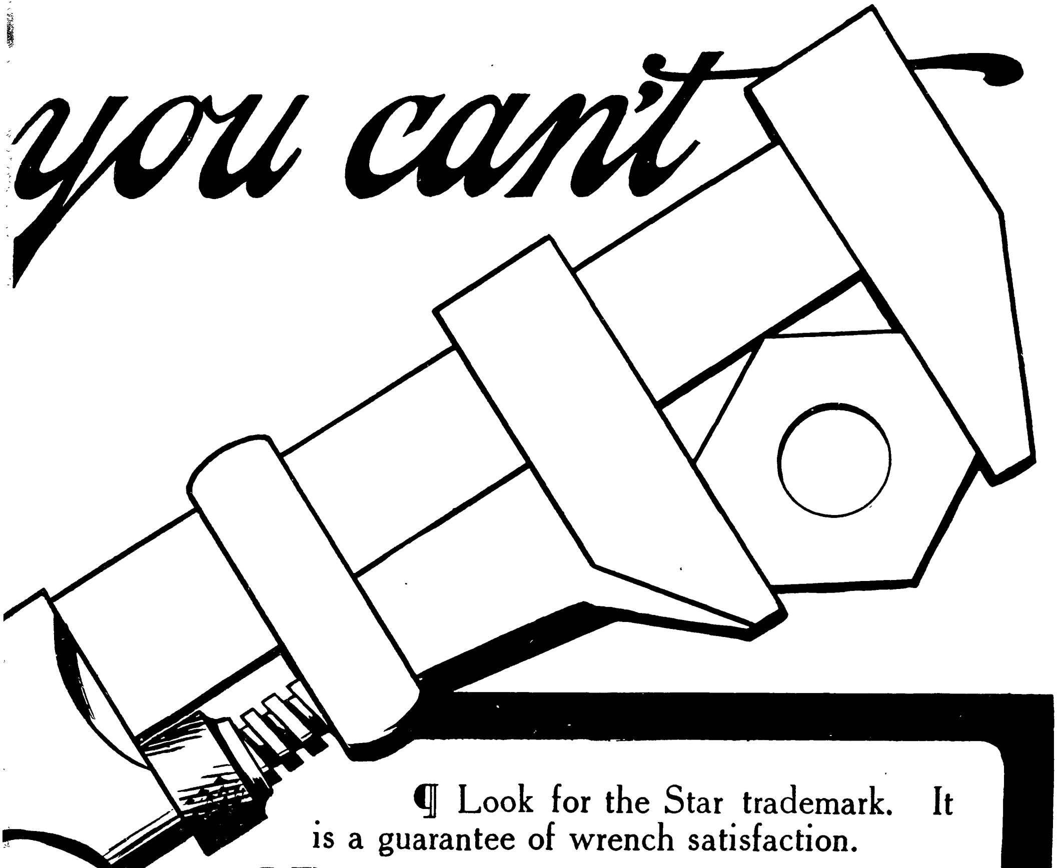
May we quote you our advertising rates?

ILIFFE & SONS, Ltd., 20 Tudor Street
London, E. C., Eng.

The Wrench Wrench
COES



¶ It's built like a watch for accuracy, and like a battleship for strength. When it grips the nuts there is no play in the adjustments to injure nut and eventually make the wrench useless.



¶ Look for the Star trademark. It is a guarantee of wrench satisfaction.

¶ There are enough woes for the average automobilist when in trouble. Why not protect yourself against those annoyances arising from the use of an "**almost good**" wrench, by buying a "**COES,**" which most everyone knows kills all wrench woes?

91

¶ If the **COES** were not the best wrench made, it would not out-sell all others. "The one big bet" in the wrench business is the **COES.** Think this over.

¶ Send for our Wrench Book, which tells you some things you ought to know about wrenches. **COES WRENCHES** are made in sufficient number of models to meet every requirement of the automobilist.

COES WRENCH COMPANY, WORCESTER
MASSACHUSETTS

NEW YORK AGENTS:
J. C. McCarty & Co., 21 Murray St., N. Y. City
J. H. Graham & Co., 113 Chambers St., N. Y. City

STOP! LOOK! LISTEN!

MIDDLEBY

Four-Cylinder
25 Horse Power
Air-Cooled Motor

The MIDDLEBY cars, which have given such perfect satisfaction during the season of 1908-09, and cost less to maintain than cars at double their cost, are so much improved for 1910 in construction and finish that they will prove quick sellers and among the easiest running cars manufactured. ¶ Before purchasing or securing an agency, write for our catalogue describing our latest models:—

Touring Car, -	**$1250.00**	**Single Rumble,**	**$1000.00**
Toy Tonneau, -	**1250.00**	**Surrey Type, -**	**1000.00**
Double Rumble,	**1100.00**	**Runabout, - -**	**850.00**

LIVE AGENTS WANTED

MIDDLEBY AUTO COMPANY

READING :: :: :: PENNA.

Soap Smiles

Ask the man who has tried them all and he'll tell you "Buckeye" is without question, the **best, most satisfactory** and **most economical** Auto Soap he ever used. He'll tell you he is delighted with it, makes him smile to see how it brings out the lustre of his car and makes it look like new.

It Pays to Use Good Soap

Good soap is **cheap** at any price. Cheap soap is expensive even as a gift. The quickest route to the paint shop is the "Cheap Soap" route and painters' bills come high. You can't be too critical of the soap you use on your car. Get one you know positively will not injure the finish of your car—one you can depend on—**then stick to it.**

"Buckeye Cleanser"

Preserves the Finish

Not a trace of alkali in it. Its linseed oil properties give the surface the life it needs to keep the paint from cracking and prolong the life of the finish.

It's a pure linseed oil soap—lathers freely and restores the original lustre.

Sold in Six Different Packages.

"Buckeye" is put up in six different size packages from 5-lb. pails to 450-lb. barrels.

5 lb. pails		**Kegs,**	**125 lbs.**
10 " "		**Half bbls.**	**225 "**
25 " "		**Barrels,**	**450 "**

To the Car Owner

We want you to buy "Buckeye." After you do, you'll not be satisfied with any other soap. You'll see at once the difference. If your dealer hasn't "Buckeye," write us.

To Dealers and Garages

"Buckeye" will cut down your soap bills, for it does more work, pound for pound, than any other.

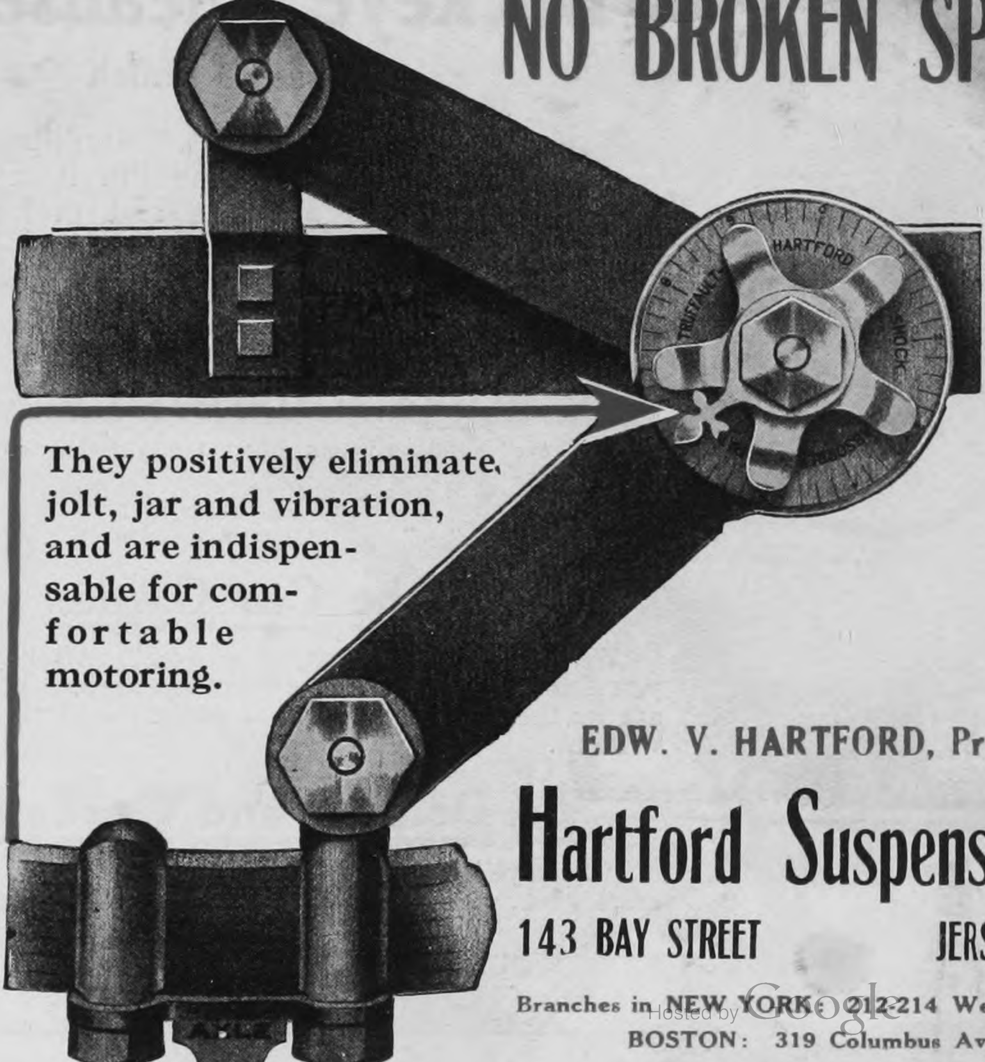
Distributed from 40 Warehouses

The J. P. Davies Company
DAYTON OHIO

OVER HUMPS AND BUMP

WITH
TRUFFAULT-HARTFORD
SHOCK ABSORBERS

NO BROKEN SPRING



They positively eliminate, jolt, jar and vibration, and are indispensable for comfortable motoring.

EDW. V. HARTFORD, President

Hartford Suspension C

143 BAY STREET JERSEY CITY, N

Branches in NEW YORK: 212-214 West 88th Stree
BOSTON: 319 Columbus Avenue

WITHOUT THE THUMPS

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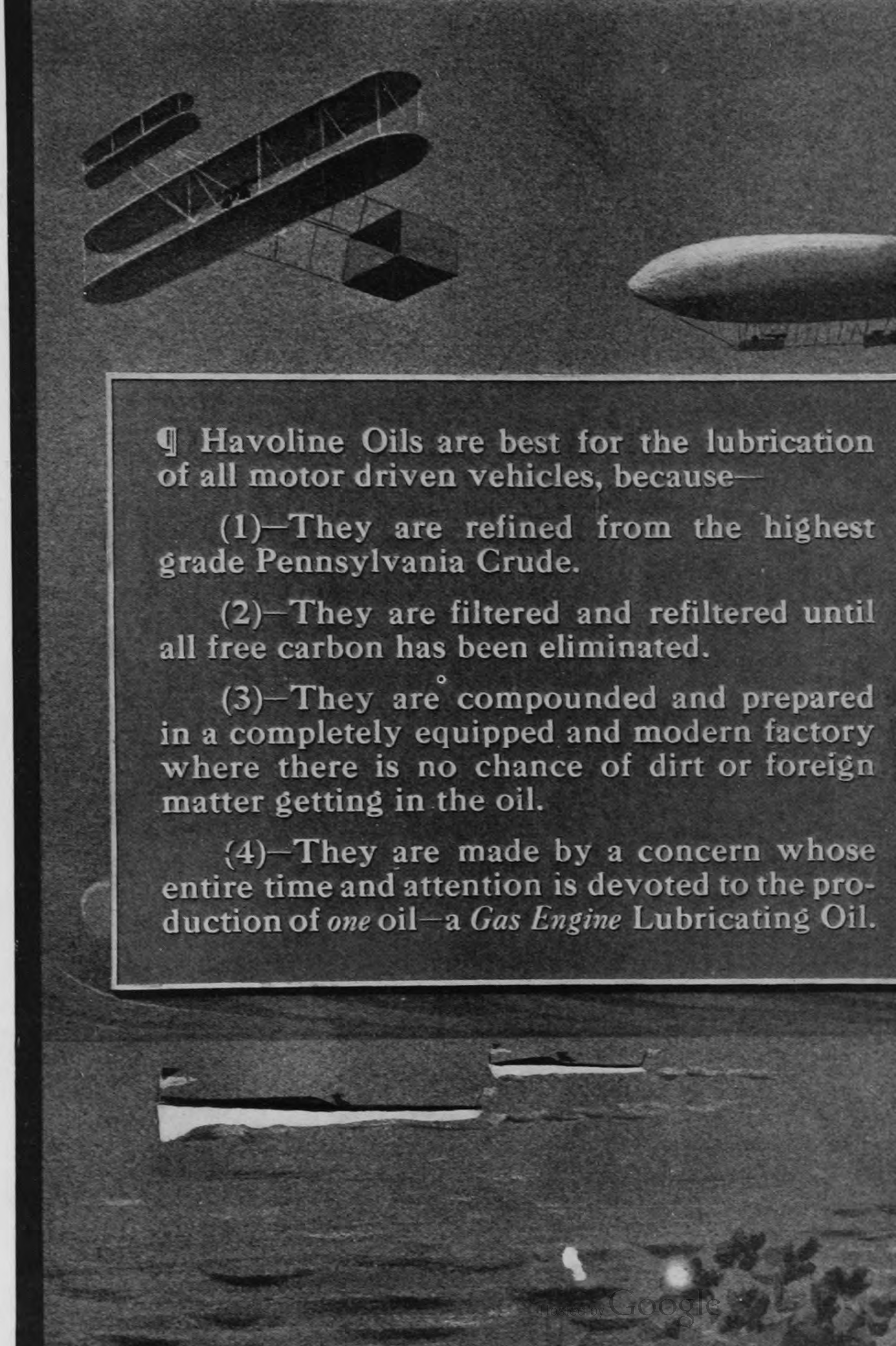


¶ Havoline Oils are best for the lubrication of all motor driven vehicles, because—

(1)—They are refined from the highest grade Pennsylvania Crude.

(2)—They are filtered and refiltered until all free carbon has been eliminated.

(3)—They are compounded and prepared in a completely equipped and modern factory where there is no chance of dirt or foreign matter getting in the oil.

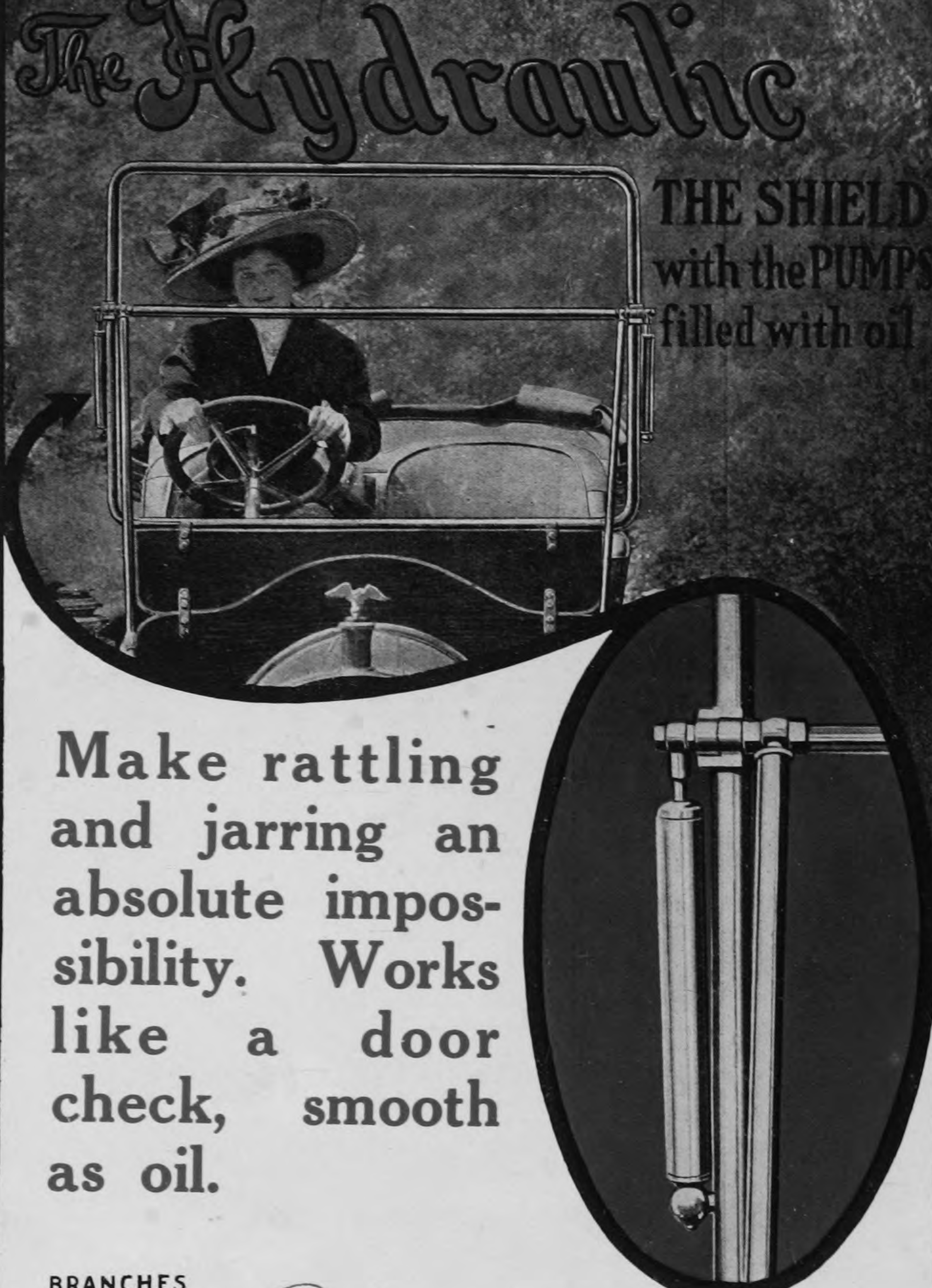
(4)—They are made by a concern whose entire time and attention is devoted to the production of *one* oil—a *Gas Engine* Lubricating Oil.

HAVOLINE OIL COMPANY
75 BROAD STREET, NEW YORK

CHICAGO: 40 Dearborn St.
BOSTON: 749 Boylston St.
ST. LOUIS: 4630 Olive St.

HAVOLINE MOTOR OILS

Pacific Coast Agents:
W. P. FULLER & CO.
All Pacific Coast Cities



The Hydraulic

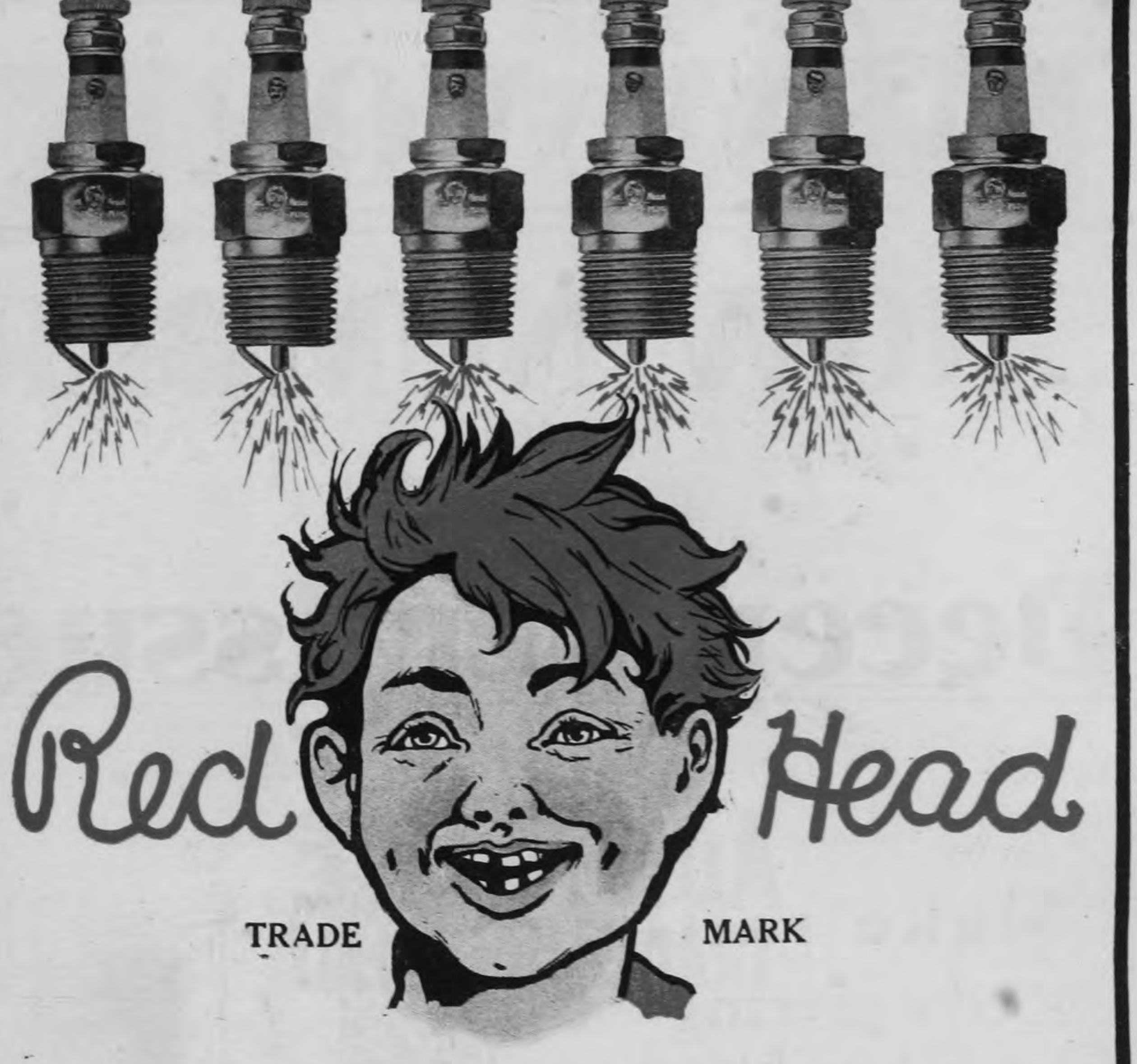
THE SHIELD
with the PUMPS
filled with oil

Make rattling and jarring an absolute impossibility. Works like a door check, smooth as oil.

BRANCHES
1436 MICHIGAN AVE.
CHICAGO

Emil Grossman Company

232 W. 58th ST.



SING A SONG OF SIX PLUGS
SPARKING IN A LINE,
EACH IS STAMPED WITH Red Head
THE ENGINE'S RUNNING FINE.

All Styles—
All Sizes—
Porcelain and
Mica
$1.00

Emil Grossman Company
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THE FIRST

NEW YORK SHOW NUMBER

FOR THE 1910 SEASON

WILL BE THE

December Issue

OF THE

CYCLE AND
AUTOMOBILE
TRADE JOURNAL
(Published in Philadelphia)

Our Show Numbers are always the largest and most important

To the Advertiser:

There will be no advance in rates for this great special issue.

Have copy reach us by November 10th.

Large and attractive ads. in this issue will pay you well.

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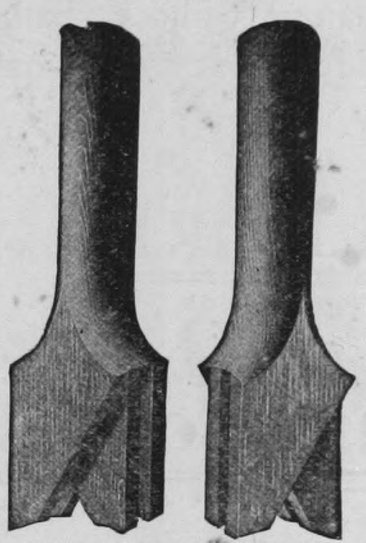
If we receive your order before Nov. 30th we can start your subscription with this special show number.

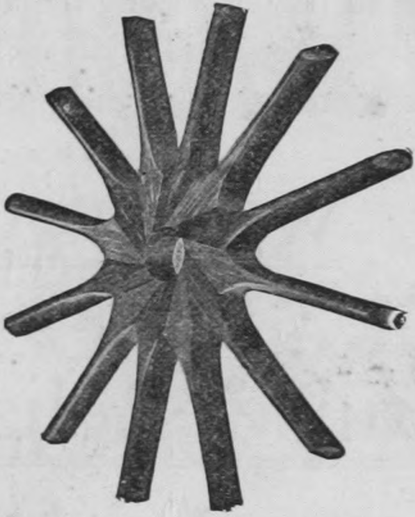
RATES

1 year	$2.00
2 years	3.00
5 years	5.00

Market & 49th Sts. CYCLE AND **AUTOMOBILE TRADE JOURNAL** **PHILADELPHIA**

THE
Schwarz Wheel
FOR
Automobiles and Heavy Vehicles


Schwarz Patent Spoke


Spokes Compressed

The only wheel with absolute spoke support. The spokes at the tenons are grooved and mortised for interlocking and are put together at one time under pressure, insuring trueness. **They can never work loose.** When put together they form a compact, immovable assemblage and the wheel may be completed with metal rim for tire and shipped without a hub.

The Best and Strongest Artillery Wheel Made

Send for illustrated booklet.

These are some of the cars equipped with Schwarz Wheels, because they are the best to be had:

Peerless, Winton, Packard, Cadillac, Lozier, American Locomotive, Premier, Crawford, Matheson, Stearns, Thomas, Apperson, Baker Electric, Columbus Buggy Electric, Fritchle Electric, Atlas, Chadwick, Autocar, Sultan, Grout, Acme, Mack Truck, Hewitt Truck, Gaeth, Mora, Frayer-Miller, Marmon, Selden, Oscar Lear Truck, American Motor Truck, Lansden Truck, Knox, Garford, Mason, Walter, Napier, Tincher, Rauch & Lang Electric, Reliance Truck, Maxwell, Croxton-Keeton, Simplex, Studebaker, Broc Electric.

The Schwarz Wheel Co.

Q. When are old tires better than new tires?

A. When they are Goodrich Tires!

It is pretty good proof of tire endurance when a set comes through a long reliability contest without change. Goodrich tires did that, in the Glidden Tour and in many other contests. But the

WINNING ELMORE

in the

Munsey Reliability Contest

—a contest of 1282 miles in 7 days, averaging 183 miles a day for a week,—this winning Elmore was shod with the SAME OLD

GOODRICH TIRES

which had carried the Elmore through the PHILADELPHIA-PITTSBURG Run,—and which had been in service EVER SINCE that run!!!

One endurance run is a good-sized task for any kind of tires—and no disgrace if more than one set are used;—but one run doesn't make a summer for a Goodrich equipment.

If this be "luck"—make the most of it.

The B. F. Goodrich Co., Akron, O.

BRANCHES IN THE PRINCIPAL CITIES

rinciple

Accuracy

Durability

Large,
Readable
Figures

nstantaneous
Reset

Maximum
Speed Hand

ones Season
Trip Odometer

mmediate
Response

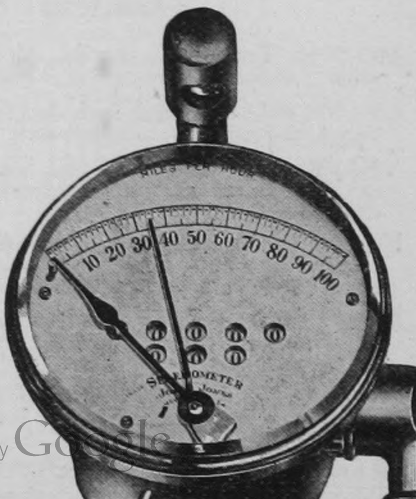
Non-Breakable
Shaft

Best
Construction

Unequalled

What You Get
IN THE
JONES SPEEDOMETER

You can't buy a better instrument at any Price. Unqualifiedly the best. "Put a Jones on your dash and look the truth in the face."


MILES PER HOUR
10 20 30 40 50 60 70 80 90 100
SPEEDOMETER

Jones Speedometer Dep't
United Manufacturers, Inc.

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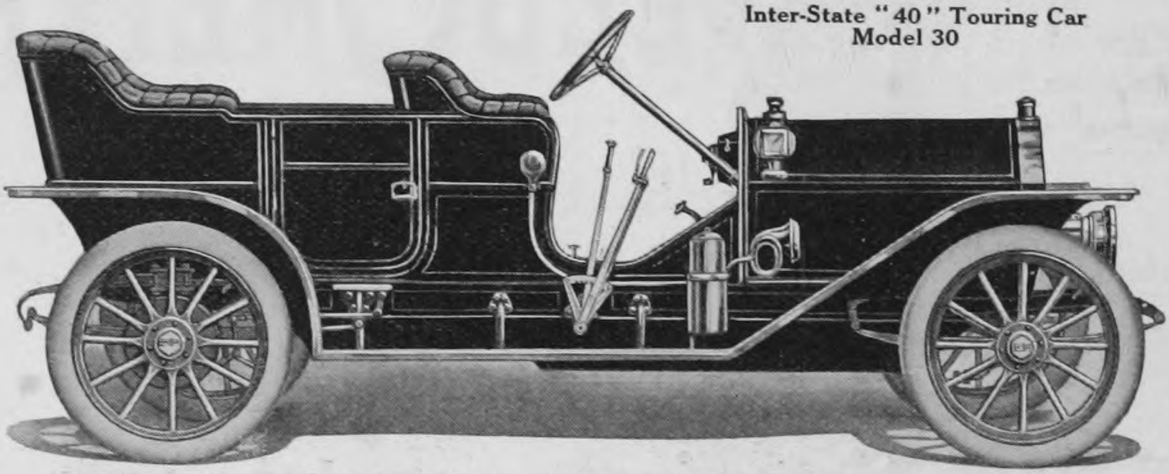
40

The Highly Refined Car at a Moderate Price

No car at any price is better than the Inter-State. It is not to be compare with cars near it in price. The Inter-State has a distinctive value in itsel



Inter-State "40" Touring Car
Model 30

The 1910 Inter-State "40," $1750

If you want a car that will start when you are ready, stop when you wis and give perfect satisfaction 365 days in the year, buy an Inter-Stat Every one said last year that we had given the most that could be give for the money. No one thought that we would be able to give mor but Inter-State improvements for 1910 have eclipsed our former recor These refinements have been universally accepted as standard and ar found in the highest priced cars. They have been tested, proved out, an fulfill all the requirements of the best motor-car practice.

General Specifications, Models 30, 31 and 32

MOTOR—Four cylinders, vertical, cast in pairs, 4½ bore x 5" stroke. Cylinders, pistons and rings ground to exact size.

CRANK SHAFT—High-grade steel drop forging, double heat treated, and ground to exact dimensions.

VALVES—Mechanically operated, large diameter and all on one side. Nickel steel heads, hardened and ground and interchangeable.

IGNITION—Two distinct systems, with separate sets of spark plugs. First system: Batteries, four-unit coil and timer; second system: U. & H. Imported High Tension Magneto.

CARBURETOR—Latest float feed type, with visible gasoline level. Easy and positive adjustment rarely affected by weather conditions.

LUBRICATION—Constant level splash system fed by gear pump. Positive delivery, extremely accessible. Sight feed on dash.

TRANSMISSION AND CLUTCH—Unit construction. Selective, three speed and reverse, with annular bearings through-

BRAKES—Four large brakes all on rear wheel drums. Inte nal expanding foot pedal brakes, dust-proof and external co tracting emergency hand-lever brakes, 2" Thermoid lined.

FRAME—Pressed steel channels of heavy cold-rolled spec steel stock, reinforced with cross members and gussets.

STEERING GEAR—Worm and sector gear, irreversible typ Large hand wheel.

SPRINGS—Semi-elliptic front, 42" long. Three-quarter ellip rear, 45" long. All two inches wide, and spring bolts provid with grease cups.

AXLE FRONT—Single piece drop forging I-beam sectio Extra large ball bearings. Special steel knuckles and ar properly treated.

AXLE REAR—Semi-floating type. Large shafts. Latest ty Hyatt roller bearings and improved ball bearings throughou

WHEEL BASE—118 inches; tread 56½ inches.

TIRES, FRONT AND REAR—34" x 4".

BODY—Alumaloyd coated steel on rigid wood frame. Se

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Inter-State 40

n Demand Throughout All America

Correctly Designed Highly Refined
Moderate Price

he 1910 Inter-State Models have established a higher standard than ever efore.

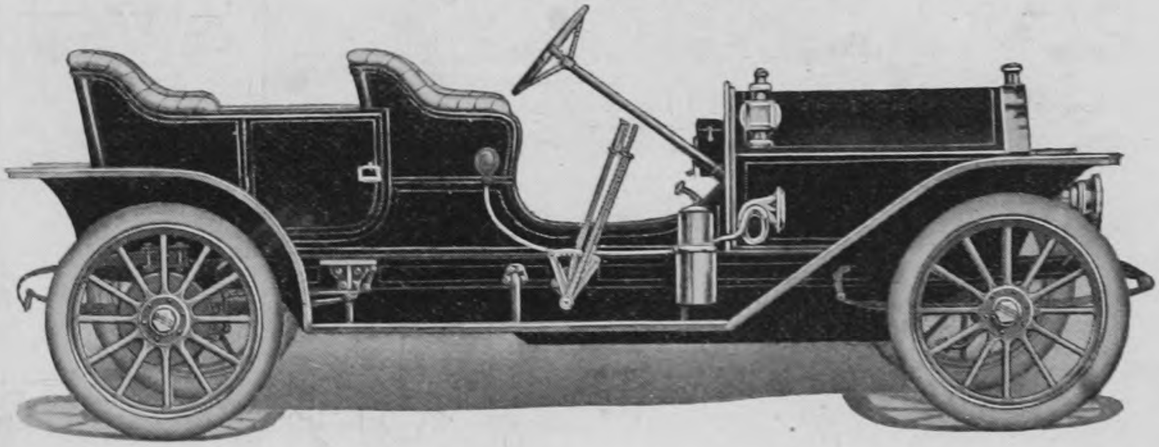
arger motor gives 14% more power and greater speed.

onger wheel base and larger tonneau give more comfort.

hree-quarter elliptic rear springs assure easier riding and longer life.

rictionless cam action means a quiet motor of increased efficiency.

These are Real Proofs of the New Standard

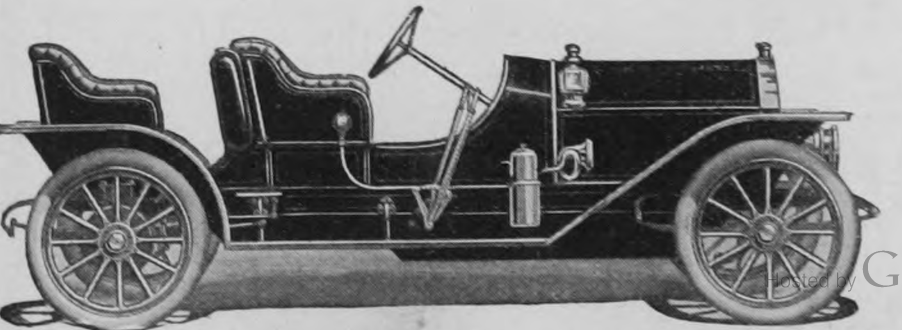


Inter-State "40" Demi-Tonneau, Model 31

"THE CAR OF THE DAY"

f you, Mr. Dealer, want a car which you can whole-heartedly recommend, with no fear of saying oo much in its favor—a car which stays sold without arguments or explanations because of terling quality and a perfection of performance which makes it satisfy this year—next year and he year after.

hen we would like to talk business with you and make you a proposition on the Inter-State which will be wonderfully appealing, because so straightforward, business-like and fair, and beause it makes for the permanency so desirable from your standpoint, but so rarely found.



Tear Out This Reminder

Inter-State Automobile Co.
Muncie, Ind.

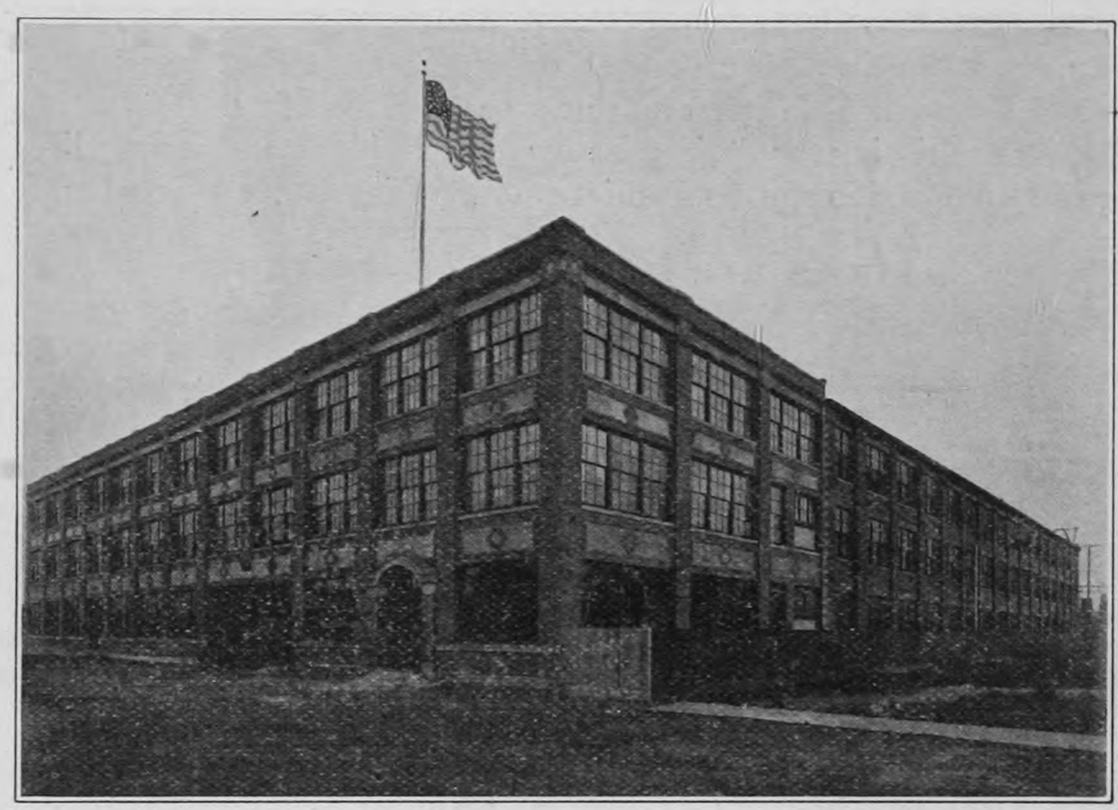
You may send me your 1910 Catalog and information on open territory.

Name ____________________

75,000 Radiators

PER ANNUM

and here is the proof



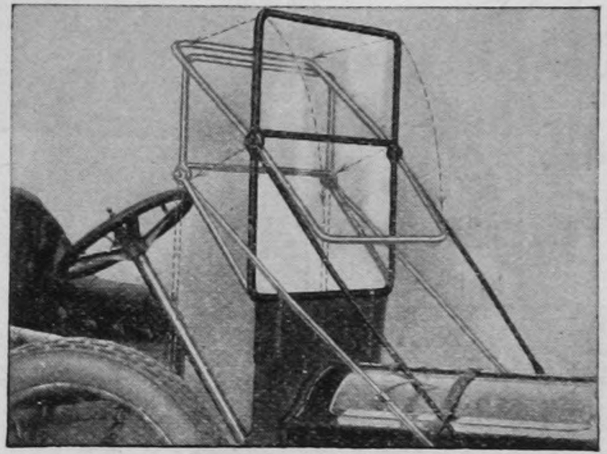
Detroit's newest factory, completed October 1st

Radiators
Fans
Lubricators
McKim Gasket

McCord Manufacturing Co.

Detroit

Dust Protection is Easy
WITH THE
Friction Wind Shield



¶ If you had to adjust your wind shield only **once,** set-screws, thumbnuts, springs and the attendant labor of adjustment would be a small matter. As it is—the necessity of changing the position of your shield to meet the varying conditions encountered – this grows to be an irksome task—unless you have

The Friction Wind Shield

¶ This you adjust instantly without slackening speed, by a touch of the hand to just the position **you** want. You don't consciously **think,** "Now I'll apply the brake"—you do it. So with the Friction Wind Shield—the act is involuntary, the thought subconscious—it's one of the natural things you do—you pull it up—that's all. Friction holds it rigidly fixed in any position.

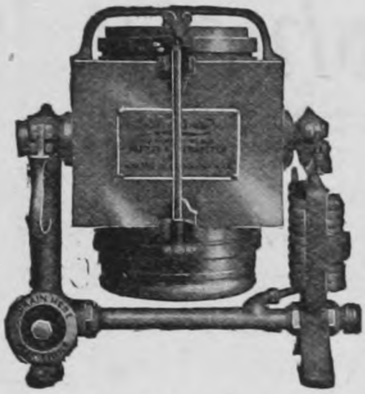
¶ The Friction Wind Shield is simple in construction—of seamless brass tubing and the best grade plate glass—easy to clean and keep clean. May be attached to any car and is worthy of the best. 6-inch, 9-inch or 12-inch filling-in board as desired, furnished with each shield. Prices: 38-inch, $27.50; 41-inch, $30.00; 44-inch, $32.50. Satisfaction guaranteed or money refunded.

WRITE TO-DAY FOR FULL INFORMATION TO

Newark Rivet Works

The Neverout

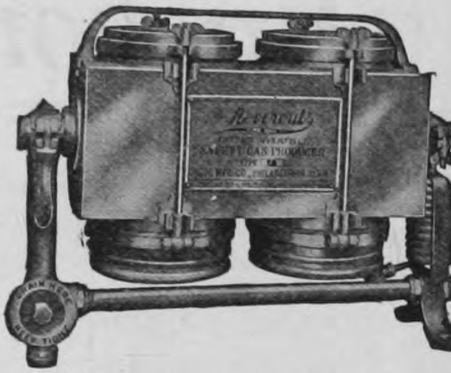
TRADE MARK



Type 8. Single cylinder, patent invertible system. **Price, $35.**

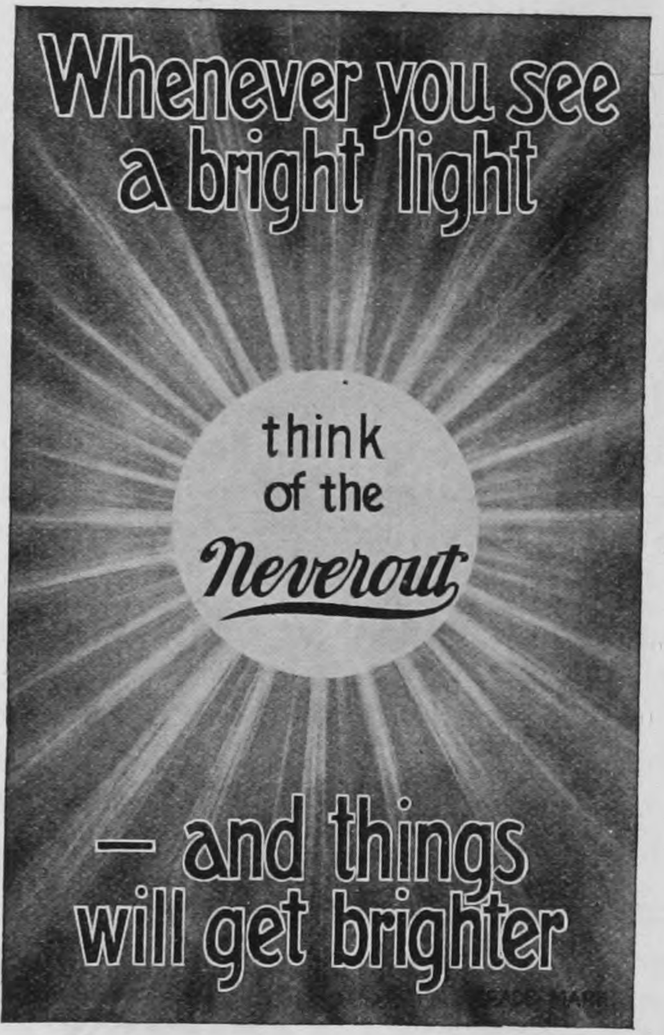
PATENT ACETYLENE GENERATORS and Searchlights

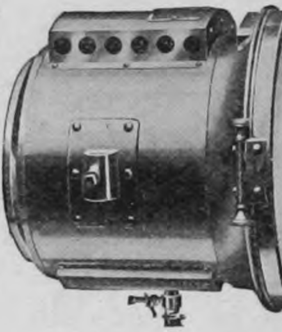
Stand Pre-eminent



Type 28. Double cylinder, patent invertible sy
tem. **Price, $50.**

ype 22. Patent air-cooled system. **Price, $15.**


Whenever you see a bright light
think of the Neverout
— and things will get brighter
TRADE-MARK



The Neverout Double Focu
Searchlight. Twice as pow
erful as the old-fashioned kinc
The only steady and unwav
ering searchlight. **Price, $3**
to $50 per pair.

ack of every Neverout Lamp and Generator stands a positive guarantee of "Satisfaction or money back." Back of that guarantee stands a company whose integrity, faithfulness and actual performance are well known throughout the world.

CYCLE AND AUTOMOBILE TRADE JOURNAL

Vol. XIV, No. 5 **PHILADELPHIA** **NOVEMBER 1, 1909**

OCTOBER EDITION, 23,078

15,539	Copies mailed at pound rates.
7,533	Copies delivered to News Company.
548	Copies to Philadelphia and foreign, etc., under stamps.
50	Copies held in reserve.
23,670	
592	Back numbers sent out.
23,078	Total copies of October edition. Of these
13,797	Were paid subscriptions.
7,533	Delivered to News Company.
21,330	
1,604	Returned by News Company to October 16, 1909.
19,726	Net total paid.

We print on this page each month an exact statement of the number of copies printed and distributed of the preceding issue of "The Cycle and Automobile Trade Journal."

The bindery count of actual complete copies produced of the October issue was 23,078.

Of these, 20,395 pounds were mailed at pound rates, as shown by post office receipts. Each copy weighs 21 ounces, representing 15,539 copies, and 592 copies of back numbers and copies returned by news companies are accounted for, in addition to the total for the month.

We will be pleased to verify the above figures at any time to anyone interested.

COMING EVENTS

American.

November 1—Indianapolis, Ind., Race Meet, Indianapolis Motor Speedway Co.

November 3-13—Outdoor Automobile Show at Salt Lake City, Utah.

November 6-13—National Automobile Show at Atlanta, Ga., in the Auditorium-Armory. Auspices of N. A. A. M., Samuel A. Miles and Alfred Reeves, Managers, 7 E. 42nd street, New York City

November 8—Savannah-Atlanta Endurance Run, under the auspices of the Atlanta Constitution, the Savannah Morning News and the Savannah Automobile Club.

November 9-13—Track meet of the Atlanta Automobile Association, Atlanta, Ga.

November 20-21—Annual Fall Track Race Meet, New Orleans Automobile Club, New Orleans, La. Homer C. George, secretary-manager.

December 29-30—Fourth Annual Mid-Winter Endurance Contest, under direction of the Quaker City Motor Club.

December 31-January 7—New York City. Grand Central Palace, Tenth International Automobile Show. Under the management of the American Motor Car Manufacturers' Association with the Importers' Automobile Salon and the Motor and Accessory Manufacturers. Alfred Reeves, General Manager, 505 Fifth avenue, New York City.

January 8-15—Tenth Annual National Automobile Show in Madison Square Garden, New York, under the auspices of the Association of Licensed Automobile Manufacturers.

January 17-22—Annual Automobile Show of the Automobile Trade Association of Philadelphia, in the Second Regiment Armory, Broad street and Susquehanna avenue.

January 24-29—Third Annual Automobile Show, in Detroit, Mich., under direction of Detroit Automobile Association.

February 4, 5, 6—Annual Mardi Gras Speed Carnival, New Orleans, Automobile Club, New Orleans, La. Homer C. George, manager.

February 5-12—Ninth annual National Automobile Show in Chicago, under the auspices of the National Association of Automobile Manufacturers.

February 22-26—Fourth annual Automobile Show in Convention Hall, Kansas City, Mo.

March 5-12—Eighth Annual Automobile Show in Mechanic's Building, Boston, under direction of the Boston Automobile Dealers' Association.

Foreign.

October 17-November 15—Competition of Industrial Vehicles, Automobile Club of France.

November 12-20—Annual Olympia Automobile Show in London, England.

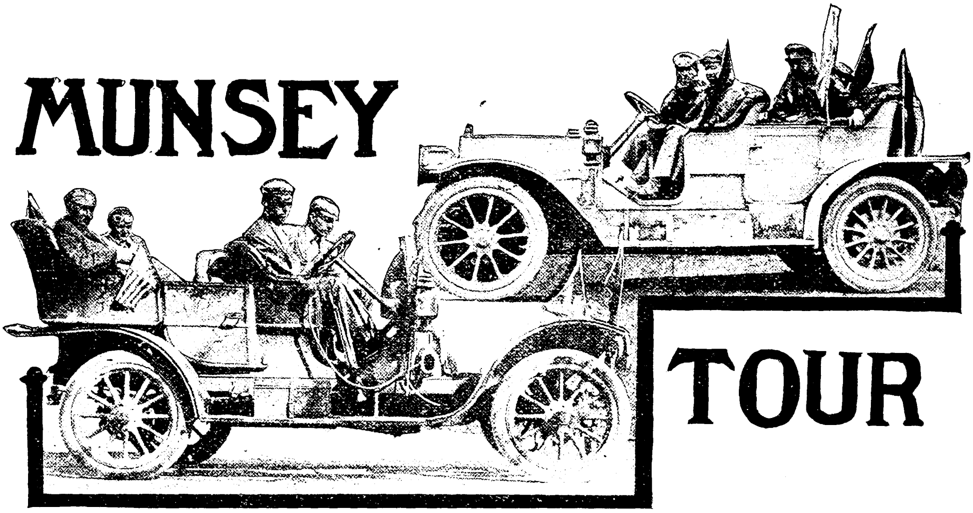
December 5-19—Reliability Trial for Light Cars, under direction of L'Auto, Paris.

January 28-February 5—Automobile Exhibition at Waverley Market, Edinburgh, Scotland, under direction of Scottish Motor Trade Association.

Briar Hill and struck a telegraph pole. Johnson was slightly injured, but Hayes was not. While on the eleventh round an exhaust valve broke on Chevrolet's Buick, No. 13, and he was forced to retire. Of the other cars Nos. 15, 9, 1, and 2 were thrown out of the race, the first two in the twelfth and seventeenth laps respectively and the other two in the twenty-first lap. Numbers 10, 23 and 3 were still running when Robertson crossed the line, thereby winning the MacDonald and Campbell Trophy and $2,500 in gold. Bert Dingley finished second, his car, the Chalmers-Detroit, No. 5, making the 25 laps in 3 hours 44 minutes and 30 seconds and winning $1,250. The third prize of $750 went to Harding in the Apperson, No. 8, with a time of 3 hours 52 minutes and 17 seconds. Next came the disabled Chadwick, finishing fourth. This car finished in 3 hours 55 minutes and 31 seconds and was driven by J. Parkin, Jr., who received the $500 prize. Strang, in the Isotta, No. 17, finished fifth, in 3 hours 56 minutes and 54 seconds. Len Zengle was presented with a gold watch for driving his Chadwick, No. 16, the fastest lap in the race, time 7.41.

Robertson's driving was very steady, and after the second lap when he jumped into first place, he seemed to have no trouble whatever in keeping the lead. One of the most interesting features of the race was the battle between the Chadwick, No. 18, driven by Parkin, and the Isotta, driven by Strang. These cars exchanged places four times, but Parkin won out and forced Strang to finish fifth.

MUNSEY TOUR



The recent Frank A. Munsey reliability run from Washington to Boston and return was a decided victory for the two-cycle engine. Machines of that type carried off first and third honors, the winner being Frank Hardart, Jr., who with his two-cycle Elmore, No. 36, entered in Division 4 for cars costing from $2,001 to $3,000, made the only perfect score in the run. The other two-cycle machine was the American-Simplex, No. 21, entered in Division 5 for cars costing from $3,001 to $4,000 by W. A. Wood. This car was third being penalized only 0.9 point.

L. H. Schaab, who entered a Renault in Division 6 for cars costing over $4,000, finished second with 0.4 point penalization. Division 1 for cars costing $850 and under was won by the Ford, No. 7, entered by C. E. Miller, who was penalized 6 points.

Twenty-nine points were scored against T. E. Lambert driving the No. 9 Maxwell in Division 2 for cars costing between $850 and $1,250 and O'Connor's Pullman, No. 12, won the third division for cars costing from $1,251 to $2,000 with 62.3 points against it.

The run, although difficult, was a success and was followed up by a smoker given in Washington to the participants.

The final scores of the various other cars are as follows:

	Division 1—$850 and under.	
29	Hupmobile (non-contestant)	1,000 pts.
	Division 2.—$851 to $1,250.	
26	Reo	94.3 pts.
	Division 3.—$1.251 to $2.000.	
5	Washington	68 pts.
24	Crawford	71.9 pts.
31	Washington	438.7 pts.
32	Washington	1,555.6 pts.
37	Pullman (withdrawn)	1,005.4 pts.
	Division 4.—$2,001 to $3,000.	
1	Chalmers-Detroit	50.9 pts.
11	Maryland (non-contestant)	1,000 pts.
14	Spoerer	6.3 pts.
15	Columbia (non-contestant)	1,000.1 pts.
16	Croxton-Keeton (withdrawn)	1,000 pts.
18	Corbin	662.1 pts.
20	Winton Six	5.5 pts.
30	Marmon	0.7 pts.
34	Selden (withdrawn)	100.2 pts.
	Division 5.—$3,001 to $4,000.	
17	Croxton-Keeton (withdrawn)	1,009.5 pts.
	Division 6.—$4,000 and over.	
27	Matheson (disqualified)	

Coming Automobile Shows

The automobile show season is now at hand, this month marking the opening of the first, namely, the Atlanta show, which will open on the 6th and close on the 13th. This show will be the first of its kind ever held in the South and without doubt will be an annual event. It will be held in the Auditorium-Armory under the auspices of the N. A. A. M. and managed by S. A. Miles and Alfred Reeves, 7 East 42nd street, New York City.

Next comes the Tenth International Automobile Show, under the auspices of the American Motor Car Manufacturers' Association with the Importers' Automobile Salon and the Motor and Accessory Manufacturers. As usual it is held in the Grand Central Palace, 43rd and Lexington avenue, New York City. The same as last year, the show will open New Year's Eve and close Friday evening, January 7th. On the following day, Saturday, 8th, the Tenth Annual National Show at Madison Square Garden, New York, will open under the auspices of the Association of Licensed Automobile Manufacturers.

February 5th is the opening date of the Ninth Annual National Automobile Show of Chicago under the auspices of the N. A. A. M., and exactly one month later the Eighth Annual Boston Show will be held, in the Mechanics' Building. The latter show will be managed by Chester I. Campbell, 5 Park Square, Boston, Mass.

PALACE SHOW SPACES ALLOTED

A total of 305 exhibitors were allotted space at the recent drawing for space for the Grand Central Palace Show, which will be held January 8-15. Thirty-seven members of the association and 40 non-members were given locations for the exhibition of cars. Those members that have joined the licensed association will fulfill their Palace show contracts.

The first choice was secured by the Ford Motor Co., of Detroit, Mich., and this concern selected the same space in which they have exhibited their cars for the past two years. Other concerns securing large spaces are the Reo Motor Car Co., Premier Motor Mfg. Co., Dayton Motor Car Co., Brush Runabout Co., Mitchell Motor Car Co., Maxwell-Briscoe Motor Co, Mora Motor Car Co., and Jackson Automobile Co. Others who drew preferred positions include Marmon, Oakland, Regal, Pullman, Moline, Lambert, Hupmobile, National, Atlas, McIntyre, American-Simplex, Austin, Moon, Pennsylvania, American, Cartercar, Holsman, Chadwick, Pierce, Glide, Standard, Ohio, Gaeth, Speedwell and Midland. Members of the Importers' Automobile Salon have secured a block of preferred space on the main floor, in which the Fiat, C. G. V., Panhard, Renault, Lancia, Clement, Isotta, Dietrich, Delahaye, Delaunay-Belleville, DeDion, Hotchkiss, Zust and S. P. O. cars will be exhibited. The first balcony has been allotted partly to pleasure vehicle makers and also commercial vehicle makers. On the second balcony will be found accessory makers as well as about 18 makers of pleasure vehicles. The old time custom of demonstrating cars will be continued at this year's show in deference to the wishes of the agents, individual owners and purchasers of commercial vehicles and taxicabs

The decorations will picture a trellis garden or outdoor effect, and will be put up by Unitt & Wickes of New York. One of the most spectacular features of the decoration scheme will be an electric fountain at the end of the main exhibition hall, where the heroic statue of "Age Instructing Youth" stood last year.

GARDEN SHOW THIS YEAR WILL BE BIGGER THAN EVER

The very last inch of available space in Madison Square Garden has been allotted for the purposes of the tenth annual show under the auspices of the Association of Licensed Automobile Manufacturers to be held January 8-15, yet Secretary H. L. Downs is being besieged daily for more space. By further ingenious engineering there will be more floor space available than last year and the decorative effects are to be still a bit more magnificent than ever.

A glimpse of the decorative scheme indicates how extensive and beautiful will be every detail in this connection. Richness, elegance and solidness to the fittings and a note of genuineness will resound throughout the decocrative effects. The principal attraction that will be relied upon to hold the attention of the automobile public will be the standard cars of the oldest and best makers. The same policy of having all the furnishings and signs in charge of the managers and made a part of one harmonious scheme, will be followed. Besides pleasure and commercial cars there will be a complete assortment ot the smallest type of motor vehicle, the motorcycle. The exhibition of motorcycles at the Garden will be the only one of its kind to be held in New York, being several times larger than at any previous show.

The Atlanta Show

The determination of the people of Atlanta, Georgia, the generosity of their offers, and increasing interest in automobiles in the South led the National Association of Automobile Manufacturers to sanction the holding of a national show in that city. Up to this time no such sanction has been granted outside of New York and Chicago. The show opens on November 6th, Saturday evening, and continues for one week, closing the following Saturday evening, the 13th. The famous reputation enjoyed by the Southerners for hospitality is already making itself felt, and it is believed the show will be a record breaker by the substantial manner in which professional and business men have contributed to the entertainment fund. Atlanta now has an opportunity to show what can be done, and a spirit is evident to outstrip, if possible, the record made at Savannah during the time of the Grand Prix races a year ago.

The show is in the armory, of which Atlanta boasts a large one, as shown in the accompanying illustration, and in spite of its size all the space has been taken, and many have had to be satisfied with less than they desired.

THE DECORATIVE SCHEME.

The decorative scheme is elaborate. The main floor centre has a row of columns supporting red and white signs of a uniform character with raised letters, the whole surmounted by artificial flowers. At each end and on the sides are platforms about 15 feet in height with a rail. The background of these spaces is covered with green burlap to the height of the signs and backed by double rail fences while the signs are supported by half posts in a style to match those in the centre. A border of oil paintings, each 8 feet high by 20 feet long depicting famous motoring incidents and scenes, forms a frieze and an important part of the decorative scheme. Above these pictures is a broad belt of red burlap reaching to the top of the balcony roof, and flags, eagles, shields and bunting are used to relieve the top strip. The inside of the balcony is draped with flags and bunting artistically arranged on and between the columns. Flowers are used in abundance in all parts of the building. The ceiling of the main hall is profusely decorated with flags and bunting, the latter in strips forming artistic folds. There are also hanging eagles and shields with effective decorative lighting.

Taft Hall at the right of the entrance, one of the handsomest of its size in the country, is decorated in the same general manner and brilliantly illuminated. The basement is decorated in a similar fashion. The floor covering is of a green denim with a red border and, like a carpet, is in one piece in each exhibit. The rails dividing the spaces are guilded and smilax is plentifully used adding to the general color scheme.

A public comfort department with S. C. Dobbs, of Atlanta, as chairman, has, and is finding temporary lodgings for many of those attending, and a general call to the citizens of Atlanta to open their residences and to hotel proprietors to increase their facilities has been given.

Indications are that the attendance of Southern society at the first show in the "Sunny South" will eclipse all expectations and make the show a society feature.

Invitations have been sent out to every dealer and garage proprietor in the District of Columbia, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Texas, Alabama, Mississippi, Louisiana, Arkansas, Missouri, Kentucky and Tennessee, and in addition invitations have been extended to all carriage dealers in these states, as many of the latter are taking on automobile lines.

As usual smoking is not allowed, and Wednesday the admission fee will be $1 instead of the usual price of fifty cents.

We herewith publish a complete list of the exhibitors arranged in alphabetical order, together with diagrams showing the arrangement and location of the floor spaces.

During the week of the show Atlanta's new speedway will also be inaugurated. The program includes thirty-two events in all, four of which are long distance races. One of the features of the event are the large number of cash prizes to be awarded of which there are fifteen, out of thirty-two events, and which total $7,350. Four races have been scheduled for amateurs. The big race of the meet will be the 200 mile contest for the City of Atlanta trophy. A 20-mile handicap will also be run in which only those cars are eligible that participated in the New York-Atlanta reliability run.

ATLANTA AUTOMOBILE SHOW. ALPHABETICAL LIST OF AUTOMOBILE EXHIBITORS

American Motor Car Co.	Indianapolis, Ind.
Allen-Kingston Motor Car Co.	New York.
Apperson Bros. Auto Co.	Kokomo, Ind.
Austin Auto Co.	Grand Rapids, Mich.
Autocar Co.	Ardmore, Pa.

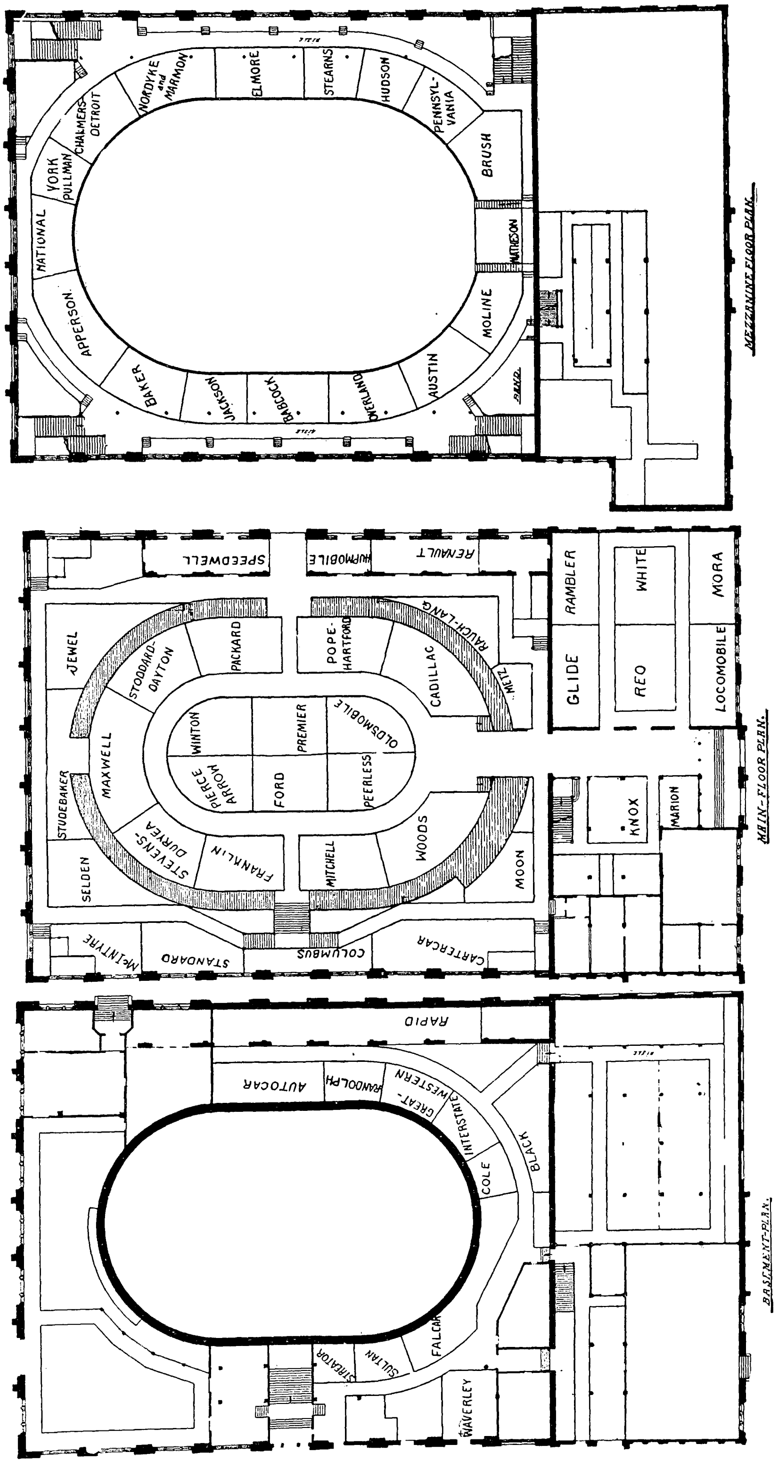
Babcock Electric Carriage Co	Buffalo, N. Y.
Baker Motor Vehicle Co	Cleveland, Ohio.
Bartholomew Co.	Peoria, Ill.
Black Mfg. Co.	Chicago, Ill.
Brush Runabout Co.	Detroit, Mich.
Buckeye Mfg. Co.	Anderson, Ind.
Cadillac Motor Car Co	Detroit, Mich
Cartercar Co.	Pontiac, Mich.
Chalmers-Detroit Motor Co	Detroit, Mich.
Columbus Buggy Co	Columbus, O.
Dayton Motor Car Co	Dayton, O.
Dorris Motor Car Co	St. Louis, Mo.
Elmore Mfg. Co.	Clyde, O.
Fiat Auto Co.	New York.
Ford Motor Co.	Detroit, Mich.
H. H. Franklin Mfg. Co	Syracuse, N. Y.
Great Western Auto Co	Peru, Ind.
Hudson Motor Car Co	Detroit, Mich.
Hupp Motor Car Co	Detroit, Mich.
Interstate Auto Co.	Muncie, Ind.
Jackson Auto Co.	Jackson, Mich.
Thomas B. Jeffery & Co	Kenosha, Wis.
Jewel Carriage Co	Cincinnati, O.
Knox Automobile Co	Springfield, Mass.
Locomobile Co. of America	Bridgeport, Conn.
W. H. McIntyre Co	Auburn, Ind.
Marion Motor Car Co	Indianapolis, Ind.
Maxwell-Briscoe Motor Co	Tarrytown, N. Y.
Metz Co.	Waltham, Mass.
Mitchell Motor Car Co	Racine, Wis.
Moline Auto Co.	East Moline, Ill.
Moon Motor Car Co	St. Louis, Mo.
Mora Motor Car Co	Newark, N. Y.
National Motor Vehicle Co	Indianapolis, Ind.
Nordyke & Marmon Co	Indianapolis, Ind.
Olds Motor Works	Lansing, Mich.
Overland Automobile Co	Indianapolis, Ind.
Packard Motor Car Co	Detroit, Mich.
Peerless Motor Car Co	Cleveland, Ohio.
Pennsylvania Auto-Motor Co	Bryn Mawr, Pa.
Pierce-Arrow Motor Car Co	Buffalo, N. Y.
Pope Mfg. Co.	Hartford, Conn.
Premier Motor Mfg. Co	Indianapolis, Ind.
Rapid Motor Vehicle Co	Pontiac, Mich.
Rauch & Lang Carriage Co	Cleveland, Ohio.
Renault Freres	New York.
Reo Motor Car Co	Lansing, Mich.
St. Louis Car Co.	St. Louis, Mo.
Selden Motor Vehicle Co	Rochester, N. Y.
Speedwell Motor Car Co	Dayton, O.
F. B. Stearns Co	Cleveland, Ohio.
Stevens-Duryea Co.	Chicopee Falls, Mass.
Streator Motor Car Co	Streator, Ill.
Studebaker Auto Co	New York.
Sultan Motor Co.	New York.
White Co.	Cleveland, Ohio.
Winton Motor Carriage Co	Cleveland, Ohio.
Woods Motor Vehicle Co	Chicago, Ill.
York Motor Car Co	York, Pa.

LOCATION OF MOTOR AND ACCESSORY MANUFACTURERS EXHIBITS

Main Floor.

Badger Brass Mfg. Co.
Fisk Rubber Co.
Electric Storage Battery Co.
The B. F. Goodrich Co.
A. W. Harris Oil Co.
Veeder Mfg. Co.

- United Manufacturers.
  - Connecticut Telephone & Electric Co.
  - Jones Speedometer Co.
  - C. A. Mezger.
  - N. Y. & N. J. Lubricant Co.
  - Weed Chain Tire Grip Co.


MEZZANINE-FLOOR PLAN.
NORDYKE and MARMON
ELMORE
STEARNS
HUDSON
PENNSYLVANIA
BRUSH
MATHESON
MOLINE
AUSTIN
BEND
OVERLAND
BABCOCK
JACKSON
BAKER
APPERSON.
NATIONAL
YORK PULLMAN
CHALMERS-DETROIT
MAIN-FLOOR PLAN.
SPEEDWELL
HUPMOBILE
RENAULT
RAMBLER
WHITE
MORA
GLIDE
REO
LOCOMOBILE
JEWEL
STODDARD-DAYTON
PACKARD
POPE-HARTFORD
RAUCH-LANG
CADILLAC
METZ
WINTON
PREMIER
OLDSMOBILE
PIERCE ARROW
FORD
PEERLESS
MAXWELL
STUDEBAKER
STEVENS-DURYEA
FRANKLIN
MITCHELL
WOODS
MOON
KNOX
MARION
SELDEN
McINTYRE
STANDARD
COLUMBUS
CARTERCAR
BASEMENT-PLAN.
RAPID
AUTOCAR
RANDOLPH
GREAT-WESTERN
INTERSTATE
COLE
BLACK
FALCAR
SULTAN
STRATOR
WAVERLEY

Diagrams of Atlanta Show

Mezzanine Floor.

Ajax-Grieb Rubber Co.
Bryne-Kingston & Co.
Diamond Rubber Co.
Jos. Dixon Crucible Co.
Empire Tire Co.
Federal Rubber Co.
Firestone Tire & Rubber Co.
G. & J. Tire Co.
Gabriel Horn Mfg. Co.
Goodyear Tire & Rubber Co.
Hartford Rubber Works Co.
Hartford Suspension Co.
Kokomo Electric Co.
Michelin Tire Co.
Morgan & Wright.
National Carbon Co.
Oliver Mfg. Co.
Republic Rubber Co.
C. F. Splitdorf.

Second Floor.

Adam Cook's Sons.
S. F. Bowser & Co.
Dayton Rubber Mfg. Co.
Dow Tire Co.
Herz & Co.
High Wheel Auto Parts Co.
Lavalette & Co.
Leather Tire Goods Co.
Never-Miss Spark Plug Co.
Randall-Faichney Co.
C. A. Shaler Co.
Sprague Umbrella Co.
Stromberg Motor Devices Co.

Accessories.

Ajax Trunk & Sample Case Co	New York.
Chicago Wind Shield Co	Chicago, Ill.
Cloud-Stanford Co.	Atlanta, Ga.
Emil Grossman Co.	New York.
Chas. E. Miller	New York.
W. F. Polson	Buffalo, N. Y.
Post & Lester	Hartford, Conn.
Rutherford Rubber Co.	Rutherford, N. J.
Shipman Instrument Co.	Sunbury, Pa.
Vehicle Apron & Hood Co	Columbus, O.

Motorcycles.

Milton W. Arrowood Co	Atlanta, Ga.
Aurora Automatic Mchy. Co	Chicago, Ill.
Consolidated Mfg. Co.	Toledo, O.
Excelsior Supply Co.	Chicago, Ill.
Greyhound Motor Works	Buffalo, N. Y.
Hendee Mfg. Co.	Springfield, Mass.
N. S. U. Motor Co	New York.

S. A. E. TO HOLD MEETINGS DURING NEW YORK SHOWS

The meetings of The Society of Automobile Engineers have each year more decidedly proven the value of this society to the various professional and other interests identified with the self-propelled vehicle.

Many of the papers read and discussed at the semi-annual meetings show that busy as the automobile engineer is, many a one still finds time to unselfishly give to the world, in well prepared papers, the result of his experience.

Among the subjects that discussion at the Winter meeting has been asked for are: Standardization of Pneumatic Tires, Taxicabs—Requirements and Operating Cost, Carburetors—Kerosene Carburetors, Railway Motor Cars, Drawing Room Systems, Truck Tires, Valves in Head vs. T Head, Alcohol as Fuel in Internal Combustion Motors, Silencer, Radiator—Design and Efficiencies, Critical Temperatures—Cooling Curves of Alloy and Other Steel, Two-Cycle Motor Efficiency and Results, Journal Loads in Transmission Gears, Placing Society on More Professional Basis, Efficiency of Spur, Bevel Worm Gears and Universal Joints, Relative Efficiency of Four Wheel Front and Rear Drive of Commercial Vehicles, Detachable vs. Demountable Rims—Combination Rim, Commercial Vehicle Depreciation.

All that care to be present at the professional meeting of the society during its New York Shows, are heartily welcome and are invited to join in the discussions or supply complete papers; the latter should be sent in to the society's offices at No. 2 Rector street, New York, to be in the society's hands by November 30 for printing and general distribution before the meeting. Papers and discussions from an engineering standpoint, including also matters of operating finances are in order.

RACE DATES AGREED UPON

At a recent meeting of the directors of the New Orleans Automobile Club the dates of the annual Fall and Mardi Gras auto races were set. Saturday and Sunday, November 20 and 21, were decided upon for the Fall meet, while the Mardi Gras was scheduled for February 4, 5, and 6.

nent of a reduction in the price of the 3rush Runabout, manufactured by the 3rush Runabout Co., Detroit, Mich. This ar, which formerly sold for $500 has been educed to $485. The H. P. has been inreased from 7 to 10 and wheel base has een increased 6 inches. The company is uilding an immense new factory for the 910 season, and will build 10,000 machines.

BREEZE COMPANY BUILDS

The Breeze Carburetor Co., of 276 Haley street, Newark, N. J., is building a renforced concrete factory, which will be deoted to the making and selling of Breeze arburetors, strainers, check valves, etc. bout two months ago this company purhased fourteen lots comprising 35,000 quare feet on South street, between Jeferson and Pacific streets.

The roof, floor, and side walls will be of oncrete, except a portion of the side walls vhere ornamental brick facings will be sed. The equipment throughout is most nodern and includes fire proofing and prinkler systems.

The machine shop alone will have a ca-

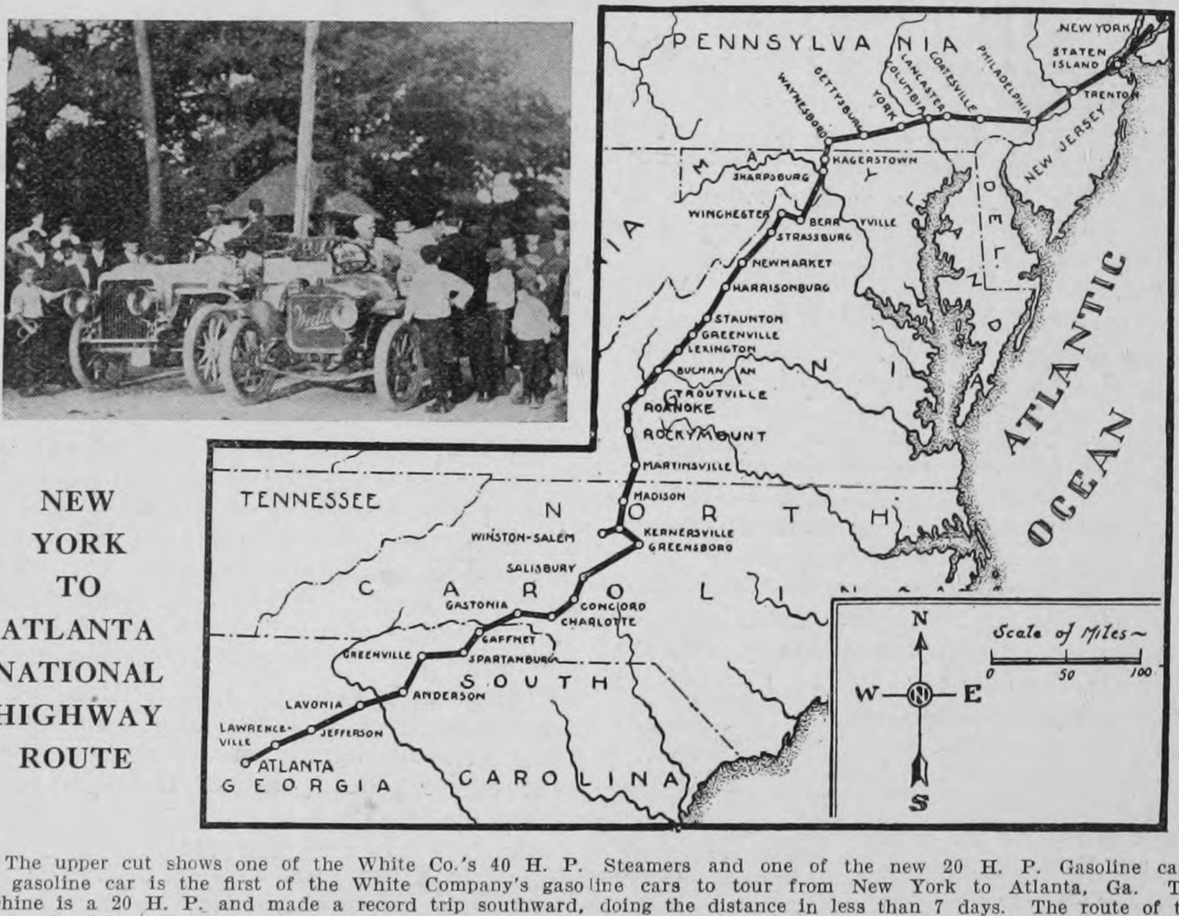
ness has necessitated the moving of the offices from 276 Halsey street to 14 William street.

OVERLAND COMPANY JOINS THE LICENSED ASSOCIATION

The Overland Automobile Co., with factories located at Toledo, O., and in Indianapolis, announced on Oct. 7th, that all the Overland and Marion cars will now be manufactured under the famous Selden patent.

By the purchase of the Pope-Toledo Motor Car plant, patents and good-will, early last summer, the company acquired a membership in the licensed association, and it is under these rights, secured from the Pope-Toledo Co., that the Overland will operate in future.

Marking municipal automobiles is the plan being considered by the city council of Toronto, Ont. The idea is to have some distinguishing mark or design, such as the name and coat of arms, enameled on the sides of the cars.


PENNSYLVANIA
NEW YORK
STATEN ISLAND
TRENTON
PHILADELPHIA
CORTESVILLE
LANCASTER
COLUMBIA
YORK
GETTYSBURG
WAYNESBORO
NEW JERSEY
HAGERSTOWN
SHARPSBURG
WINCHESTER
BERRYVILLE
STRASSBURG
NEWMARKET
HARRISONBURG
STAUNTON
GREENVILLE
LEXINGTON
BUCHANAN
TROUTVILLE
ROANOKE
ROCKYMOUNT
MARTINSVILLE
MADISON
KERNERSVILLE
GREENSBORO
WINSTON-SALEM
SALISBURY
CONCORD
CHARLOTTE
GASTONIA
GAFFNEY
SPARTANBURG
GREENVILLE
ANDERSON
LAVONIA
LAWRENCEVILLE
JEFFERSON
ATLANTA
GEORGIA
TENNESSEE
NORTH CAROLINA
SOUTH CAROLINA
MARYLAND
DEL.
VIRGINIA
ATLANTIC OCEAN
N
S
E
W
Scale of Miles
0
50
100

NEW YORK TO ATLANTA NATIONAL HIGHWAY ROUTE

The upper cut shows one of the White Co.'s 40 H. P. Steamers and one of the new 20 H. P. Gasoline cars. he gasoline car is the first of the White Company's gasoline cars to tour from New York to Atlanta, Ga. The nachine is a 20 H. P. and made a record trip southward, doing the distance in less than 7 days. The route of the National Highway" which was compiled by R. H. Johnston, of the White Co., is also shown. The route leads across taten Island, then to Trenton, crosses the Delaware River at that point, and thence proceeds to Philadelphia. rom Philadelphia, the route leads almost due westward to Gettysburg, via Lancaster and York. At Gettysburg, the oute turns southward to Hagerstown, thence to Shepherdstown, West Virginia, and from there to Winchester. From

PUBLICITY NOTES

Charles Gordon, until recently with the Whitlock Coil Pipe Co., of Hartford, Conn., has severed his connection with that firm and removed to Detroit, where he will start in the automobile business.

The Milwaukee Automobile Club has started preliminary preparations for its second annual motor show, which will be held in the spring. The show will be held in the new $500,000 auditorium, recently dedicated.

Again Doubles Floor Space—The K-W Ignition Company of Cleveland, Ohio, has again doubled its floor space and is preparing to manufacture their well known high grade magnetos and coils in a very much larger quantity next season.

Harold L. Pope has become connected with the Matheson Motor Car Co., of Wilkes-Barre, Pa. Until recently Mr. Pope was connected with the Overland Automobile Co. and previous to that was associated with the Pope Motor Car Co., of Toledo, O.

The Western Motor Co., of Logansport, Ind., has recently taken possession of its new factory at Marion, Ind., which, together with the present factory, will make it possible for this concern to triple is output of this year. The new establishment is 450x65 feet, two stories high.

Rumors Denied—We have been notified by the Warner Mfg. Co., of Toledo, O., that there is absolutely no connection whatever between that concern and either the Overland Automobile Co. nor the Warner Gear Co., of Muncie, Ind., and that all rumors to that effect are unfounded.

The Star Rubber Co., of Akron, Ohio, well known as a manufacturer of druggists' rubber goods, has recently increased its capital from $100,000 to $250,000 and is erecting an additional three story factory, the first two floors of which will be devoted to the manufacture of automobile tires.

Osburn Foundry Co. Changes Name—The Osburn Foundry Company, of Chicago and Detroit, has been dissolved, and the Osburn Electric Company organized to do business at the same address. The assets of the old company have been included in the increased assets of the new one and the liabilites of the old company have been assumed.

R. E. Fulton, eastern wholesale distributor for the Croxton-Keeton Motor Co., Massillon, Ohio, recently sailed to Europe on a four weeks' visit to look over the foreign situation. On his return he will again direct the Eastern wholesale distribution of Croxton-Keeton cars, in conjunction with J. P. Stoltz, of the New York City branch.

F. M. Doubleday has presented the Aero Club of America with a handsome silver trophy to be known as the "Country Life Trophy," for competition of heavier than air machines during 1910. A gold trophy worth $5,000, together with a cash prize of $2,500 has also been presented for the heavier than air competition by Mr. Robert J. Collier.

The Sheffield Gas Power Co., of Sheffield Station, Kansas City, has recently purchased the entire assets, factory and good will of the former Weber Gas Engine Co. The management of the business, as well as the sales and factory departments, are in entirely new hands. Geo. M. Hawes, is president; Freeman Field, vice-president and treasurer, and W. H. Spiller, assistant manager.

The Jackson Automobile Co. recently filed suit in the county courts at Indianapolis against the Indianapolis Motor Speedway Co., to compel that concern to turn over to the Jackson Company the Wheeler and Schebler trophy, which was to have been the prize in the 300-mile race held at the Speedway in August. The race was called off while the Jackson car was in the lead and it is on this that the suit is based.

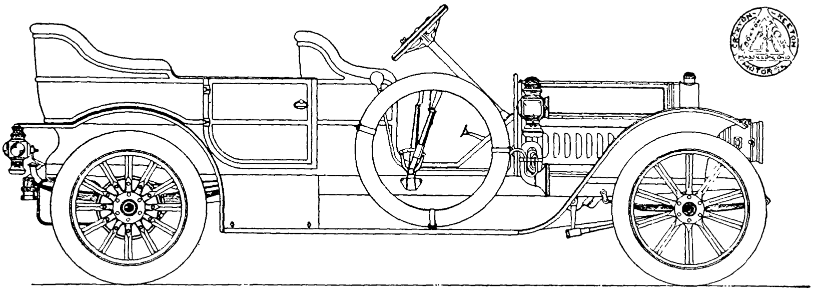
R. S. deMitkiewicz, member of the gas power section of the American Society of Mechanical Engineers, formerly with the Fairbanks Company in gas power work, has become connected with the Alden Sampson Manufacturing Company of Pittsfield, Mass., manufacturers of motor trucks and gas electric road trains. Mr. deMitkiewicz will be associated with their New York office, 115 Broadway, as power sales engineer in mechanical transportation.

The Horseless Age was recently sold to Fred. J. Wagner and Charles B. Ames by the founder and owner, E. P. Ingersol, who has been in ill health for the last six months and will travel. Each of the new owners are well known to the automobile trade and public. Fred. J. Wagner until two years ago was an advertising man for Motor Age and since then he has been before the public as a member of the Wagner-Field Advertising Agency and as official starter for most of the big motoring events. Charles B. Ames has been well known to the trade as the advertising manager of Motor.

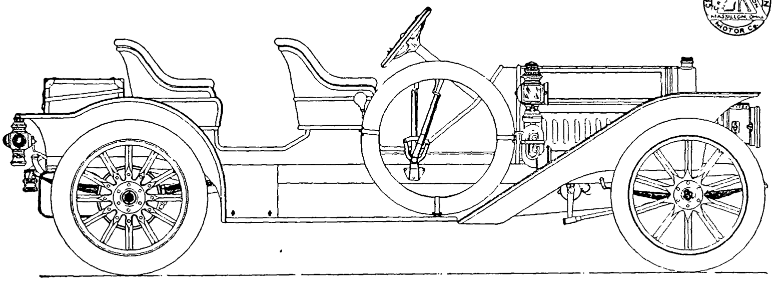
Croxton-Keeton Cars

For 1910

"German 45" Types



GERMAN 45 TOURING CAR, $3500



GERMAN 45 ROADSTER, $3500

Each model has 45 H. P., 4 cylinder vertical engine. Dual ignition system, with Bosch High Tension Magneto. Selective sliding gear transmission. Three speeds forward and reverse. Wheel base, 130". 36" wheels. Tires, 4" front and 4½" rear—any standard make. Furnished with 7-passenger touring body, $3500; 5-passenger, close coupled, $3500; 3 or 4 passenger roadster, $3500; 7-passenger limousine, $4000.

Our line also includes the French 30 models—4-passenger suburban, $2850; 6-passenger touring car, $3250; landaulet, $3300; brougham, $3500.

DEALERS—don't close for your 1910 cars without first thoroughly investigating the **CROXTON-KEETON** line, and getting our proposition.

The Croxton-Keeton Motor Co.

Massillon, Ohio

NEW YORK
1662 Broadway

PROVIDENCE
430 Broad St.

PITTSBURGH
5920 Baum St.

TOLEDO
233-7 Ontario St.

CLEVELAND
2174 E. 9th St.

KANSAS CITY
425 Delaware St.

CHICAGO, Michigan Ave. and 21st St.

GENERAL INDEX

Additional Indexes will be found at the back of the book; a "Buyers' Classified Index" of the entire contents of the book, both reading and advertising pages, and an alphabetical index to the advertisements.

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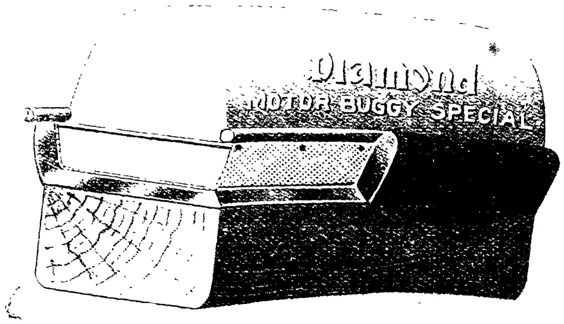
¶ **The Motor Buggy owner demands**

¶ **The Motor Buggy Dealer specifies**

¶ **The Motor Buggy Manufacturer supplies**



SIDE WIRE TYPE

BECAUSE

¶ The stock is "just right" for Motor Buggy Use and Service Records have proved its greater efficiency.

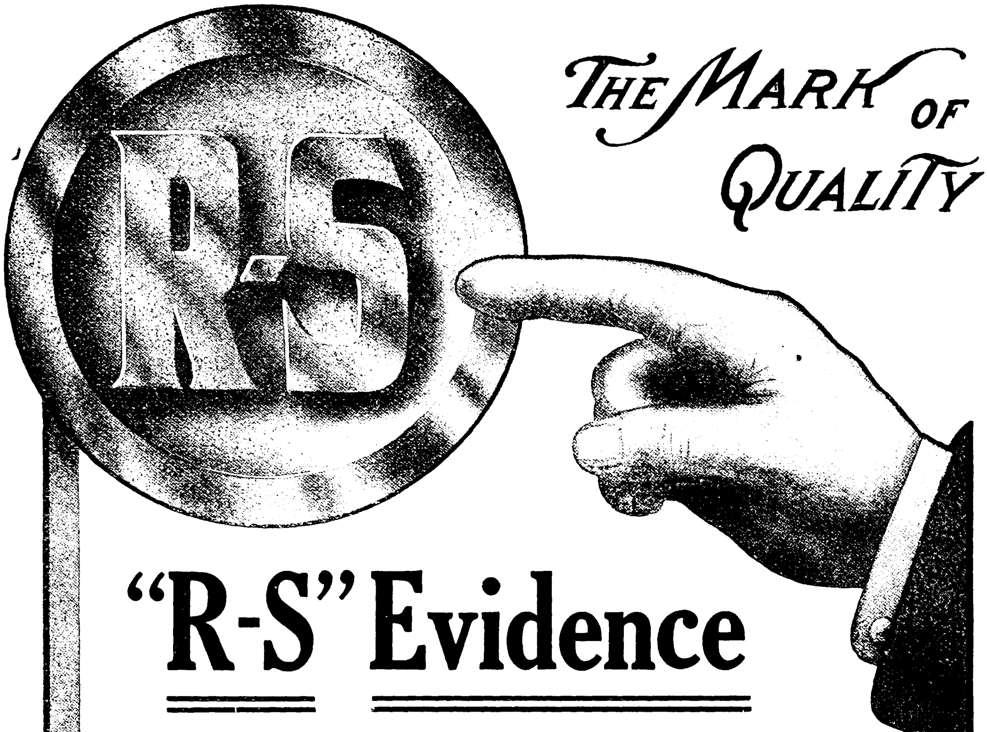
Diamond Motor Buggy Special Tires

are made for Motor Buggy or High Wheel automobile service and no other.

¶ Four types: Internal Wire, Side Wire, Clincher and Combination Side Wire and Internal Wire.

THE DIAMOND RUBBER CO., Akron, Ohio

New catalogue just off the press—is yours for the asking.



"R-S" Evidence

"R-S" Wins=

At CHICAGO, ILL., Labor Day Races:

First in 5-mile race,
First in 10-mile race.

At ROME, GA., Labor Day Races:

First in 5-mile race for Single Cylinders,
First in 10-mile race free for all.

At SPRINGFIELD, MASS., Labor Day Races:

"R-S" Wins second against a "Special" of prominent make with auxiliary ports.

At WILDWOOD, N. J., Labor Day Races:

First in Event No. 1, 30½ cu. in.
First and Second in Event No. 2, 48½ cu. in.
Second in Event No. 3, 61 cu. in.
In time trial R. SEYMOUR makes mile in 45⅖ seconds.

At WICHITA, KAS., Labor Day Races:

First in 2-mile race for Single Cylinders.

At ROCHESTER, N. Y., Labor Day Races:

First in 3-mile novice race.

At TROY, N. Y., August 28, 1909:

First in 5-mile race.

Agents wanted Everywhere. *Write for art catalogue*

READING STANDARD CO.

Bingaman and Water Streets, Reading, Pa., U. S. A.
Built and Tested in the Mountains

CYCLE AND
AUTOMOBILE
TRADE JOURNAL

ENTERED AT THE PHILADELPHIA POST OFFICE
AS SECOND-CLASS MAIL MATTER

PUBLISHED MONTHLY BY THE
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EASTERN REPRESENTATIVE
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CHAS. E. DURYEA, J. A. KINGMAN } Mechanical Editors

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Philadelphia, November 1st, 1909

TOO MUCH OF A GOOD THING

In every line connected with the automobile industry there is now presented a scene of unusual activity. Never since the beginning of the automobile industry have there been so many road races, tours, reliability contests, track meets, and shows as at the present time. A few well attended properly promoted contests, undoubtedly stimulate the makers and educate the people, but there is danger of overdoing the matter. When such events are conducted by any of the large organizations and are backed by the manufacturers, they are useful, but when innumerable promoters are scheduling races in all parts of the country, and when those aside from the automobile industry promote endurance contests, tours, and other events for the possible advertising which may result, expecting the car makers to enter their machines in all of these various contests, considerable harm may be done.

We believe that endurance contests, automobile and accesory shows and road races if properly conducted by some of the automobile organizations, are of service and stimulate to better efforts on the part of the manufacturer, but we believe that the best interests of the industry as a whole, are not served by too large a crop of nondescript spectacular events. Quality is to be considered more than quantity if interest is to be maintained. The recent clean cut road race, which was held by a prominent motor club in the parkway of one of our largest Eastern cities, was one of those contests which afforded pleasure to nearly half a million people, and was well supported by manufacturers. A large event conducted in the sportsmanlike manner that this was carried out, reflects much credit on the management and will, undoubtedly stimulate the sale of cars. This race showed conclusively that events of this character can be conducted on our public highways without inconvenience and without damage to property and without loss of life. The thorough policing of the course and the manner in which one of the largest crowds ever gathered to witness an automobile event, was handled, offers an example which the promoters of other similar events, which are supposed to be more prominent, would do well to follow. We do not advocate the abolition of contests but make a plea for fewer and better contests conducted in a thoroughly clean, sportsmanlike and systematic manner.

AUTOMOBILE GROWTH AND INCREASE IN THE NUMBER OF AUTOMOBILE PARTS MAKERS

The unprecedented demand for automobiles has at last elicited from the manufacturers the announcement that they are having difficulty in securing sufficient parts to supply the number of 1910 models which they intend to build. Already this demand for parts has brought into the field many new manufacturers of these lines, some of whom are undoubtedly not well prepared for the business in hand, while others are endeavoring at short notice to get into this end of the industry and are trying to rearrange their equipment and organization.

There are several features to be guarded against owing to this condition, one of the most important of which concerns the manufacturer of automobiles, who without sufficient tests as to the nature of the products he is purchasing, may under stress buy parts from other firms than those which have supplied the majority of the parts for the year's output and difficulty may be experienced from the diversity of materials used. Undoubtedly many of the new concerns within a short time, will be able to produce just as good parts as the older makers, but there will unfortunately be some who will not be in this class and it behooves car manufacturers to more systematically test all materials which enter into the construction of their 1910 output.

The present demand is so great that it is believed the automobile production of this country for the 1910 season will be in the neighborhood of 200,000 machines. If sufficient manufacturers of other lines to supply this demand, go into the making of automobile parts, this will probably result before another year in an overproduction, as it is hardly possible that there will be a steady demand for machines sufficient to warrant, for any prolonged period, such an enormous production.

As is usually true in any other line of manufacture in which a large demand is suddenly created for certain commodities in which there are large profits, as has been true with automobile parts which might be classed as specialties, there is a sudden influx into the field of large numbers of nondescript makers, who scent the possibility of making quick fortunes. This inrush is now taking place in the parts field and it is hardly necessary to say that there will be keen competition very shortly among the parts makers, and that a speedy fortune is not at all assured to those who enter this line of production without years of previous experience in the manufacture of similar or kindred products.

The tremendous increase in the demand for cars will, however, be a great boom to many of the tool makers and manufacturers in lines allied to the automobile industry. There will be profitable work for many companies which have been more or less set back by the recent financial stringency, and it is believed that this unprecedented demand which it is almost impossible to state in money values, will be a prominent factor in bringing many lines of manufacture back upon a substantial business footing again. It will give added impetus to the development of special iron and steels particularly of the highest grades, such as used in automobile construction, and will therefore develop lines of production which for a long time were dormant in this country, the higher grade material being obtained abroad. A new era will be started in the production in quantity of special high grade steels among our own factories.

The magnitude of the automobile industry, including the manufacture of parts and accessories, can hardly now be estimated but it is certain that it ranks well among the foremost industries of the country, and owing to the slight effect which the financial depression had upon it, as compared to many other industries and its rapid recovery, its influence in preventing a longer period of depression has been very great A period of prosperity seems to be opening for the industry and it is to be hoped the various organizations concerned will guard against the great danger of a ruinous overproduction.

DEFINITE WORK FOR GOOD ROADS

Some, at least, of the automobile clubs, all of which are good roads advocates, are attacking the problem in a manner which is sure to bring at least local results. These clubs are doing something definite in the way of road improvement, in addition to carrying on the general work of bringing pressure to bear on their representatives in the State Legislature. A certain piece of road, or several roads which are notoriously out of condition or in need of repair, are chosen by the club, as its particular field and funds are raised to put these particular roads in first-class condition. This kind of individual effort on the part of the clubs should be commended, as it will result if carried out by all the automobile clubs, in rebuilding thousands of miles of roads which are badly in need of repair.

Such efforts should not be made to the exclusion of work for the good roads movement in general, but should be carried on in a local way. Every man who drives a machine over the new and improved road, if he formerly traversed the same road will be an added convert to the Good Roads Movement, and by such practical demonstrations members will be brought to realize the need for such improvements, who might otherwise take a negative attitude in the matter.

If each and every automobile club, no matter what its size, would take upon itself to personally conduct a campaign for the improvement of one definite road, in its immediate vicinity, the progress which will be made in a few years in the regeneration of our roads will be truly surprising.

CARS WHICH NOW CARRY SELDEN LICENSES

The cars which are now manufactured under Selden patents and which are entitled to carry Selden license plates are the following: Maxwell, Mitchell, Stoddard-Dayton, Overland, Marion, Premier, Jackson and Reo. With the exception of the Marion and Overland cars, the cars mentioned will be exhibited at the Grand Central Palace Show, although the manufacturers will resign as members of the A. M. C. M. A. but will live up to their contract of exhibiting at the show.

The General Motors Co., on behalf of the Buick and Oldsmobile Companies is reported to have also recently paid the Selden patent owners about a half a million dollars in back royalties.

Legislative and Legal

INTERESTING AUTOMOBILE DECISIONS

In a Connecticut case, a street car conductor sued the owner of an automobile for injuries which he alleged he had sustained by reason of the negligent operation of the defendant's car by the owner's driver. On the trial of the case the plaintiff introduced evidence to show that on the day of the injury about nine o'clock in the evening he was conductor on an open trolley car and that he was on the running board of the car engaged in issuing transfers to passengers. He was suddenly struck by a part of an automobile driven in the opposite direction from that in which the street car was moving. The trolley car was well lighted and was seen by the operator of the car when he was several squares away and there was sufficient room for the driver to have passed upon either side of the car without striking the same. On the outside of the car was an iron hook which was used for the purpose of holding the top of the car in place. This hook struck the conductor, cut a deep gash in his leg, threw him to the ground and rendered him unconscious. The court held that under such evidence it was a question for the jury to determine whether the defendant was guilty of negligence and that there was sufficient evidence to sustain a verdict rendered for the plaintiff. The defendant claimed that the damages assessed were excessive, but the court denied this contention and said that the damages could not be computed with any mathematical certainty and that the question of the amount that plaintiff should be allowed for his injuries was peculiarly within the province of the jury and would not be disturbed by the court on appeal. Knight v. Continental Automobile Mfg. Co., 73 Atlantic 751.

Two patents which consisted of devices for closing punctures in pneumatic tires especially with reference to their use on automobiles, one Glidden No. 602,743 and the other Sampson No. 632,540 have recently been the subjects of litigation. The patentees claimed that the closing of punctures in pneumatic tires is a new art which of necessity had sprung up within recent years, that the automobile tire was itself a comparatively new device and that by reason of its peculiar construction and its uses, the repair of punctures presented many questions which were of themselves new. The court held that the patents, which it was alleged had been infringed disclosed invention, were valid and that they were entitled to a fairly liberal construction in order to prevent them from palpable invasion. Schwab v. Apstein, 172 Federal 149.

The plaintiff recovered a verdict against the owner of an automobile and his driver. The facts showed that the driver, with the permission of the owner, was driving the machine in company with certain of his boon companions, when he ran into a doctor's gig which the plaintiff was driving. The trial court instructed the jury that the owner of an automobile was responsible for injuries caused by it by the negligence of any one whom he permitted to run it on a public street. The Supreme Court of New York in passing upon this instruction stated that the legal proposition involved was a novel one, but that it found full justification in the novelty of the situation. The court said: "An automobile being a dangerous machine, its owner should be held responsible for the manner in which it is used; and his liability should extend to its use by any one with his consent. He may not deliver it over to any one he pleases and not be responsible for the consequences. * * * In cases where an automobile is used without the consent of its owner, the latter should not be responsible; but, in those cases where an automobile is operated on the highway with the consent of the owner, he should be responsible." Ingraham v. Stockamore et al, 118 New York Supplement 399.

Joy riding is not to be considered illegal in New Jersey, according to the finding of a jury which tried a recent case which had that for its point of contention. It seems the owner had surprised his chauffeur during a joy ride and immediately discharged him, whereupon the latter brought suit for two weeks' wages, charging breach of contract. The motorist then entered a counter suit to recover charges for the use of the machine and damages inflicted upon it, but the jury decided in the chauffeur's favor.

The Wisconsin Legislature has delegated a special legislative committee on good roads to make a tour of inspection and investigation into surrounding states. Reports will be made at a special session in January.

1910 Tags for Pennsylvania will be of blue enamel, bearing the State name, year and license numbers in white letters. At one side there will be a keystone of soft white enamel, which will bear the manufacturer's serial number a new feature for next year.

New Jersey's 1910 Tags will be orange and black, the body being orange with black numerals. The seal and the letters "N. J." will appear before the numerals instead of behind them as on this year's tags.

Lansing, Michigan, on September 20, 1909, for a new corporation to manufacture automobiles, to be known as the "Metzger Motor Car Co.," having a capital stock of $500,000, of which $300,000 is paid in. Stockholders and officers in this company are Byron F. Everitt, President; William Kelly, Vice-President, and William E. Metzger, Secretary and Treasurer. This company will manufacture a new car designed by William Kelly, who has been designing since 1899, and was the designer of the E-M-F. Messrs. Everitt and Metzger are well known to the automobile public and automobile trade in general, and were the Everitt and Metzger of the Everitt-Metzger-Flanders Co., up to the time they sold their interests in this corporation to the Studebaker Mfg. Co., on May 1 last.

The Detroit Factory of the new "Metzger Motor Car Co."

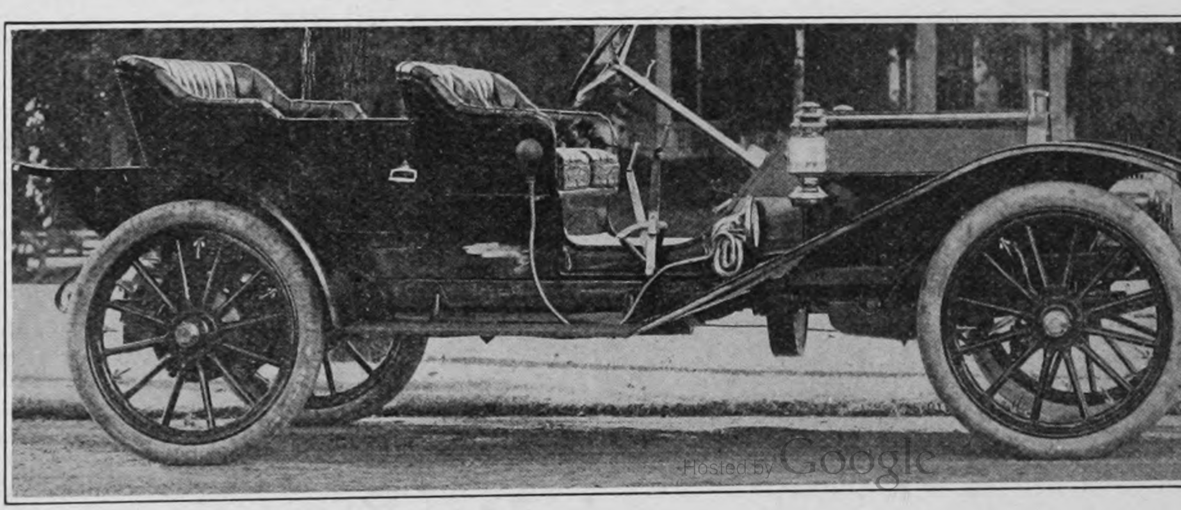
Mr. B. F. Everitt, familiarly known as "Barney," becomes the President of the new company, a similar position held by him in the now famous E-M-F. Co. Mr. Everitt was probably better known in the manufacturing field, being connected with another large industry producing parts

quaintance with the steel and machi manufacturing interests make it pos for the new company to secure all ne sary material promptly and in any q tity.

There is probably no individual id fied with the automobile industry from Atlantic to the Pacific who is better kn than William E. Metzger. He was on the very first to enter the automobil dustry in the nineties. It is unders that word passed along by his nume friends that he had intentions of again barking in the automobile manufactu field, brought in between 200 and 30 plications from established dealers to on the agency of any machine he sh see fit to make.

The new company will manufactu runabout and a 5-passenger car, to be at a popular price. The models of new car have been on the streets of troit for some time, and we herewith a photo of one of them.

The new company purchased the of the Jacob Meier Co., trunk man



t is well situated for the automobile ness and occupies two and one-half s of ground.

e machinery is being installed and company will commence delivery of ew product within a short time. It xpected that during the year of 1910 ast 5000 automobiles will be manufac- d by this concern.

NEW FEATURES.

e car has many new features, all of h have been carefully worked out by of the most experienced men in the mobile business. The steering arms knuckles are raised to the level of front axle, giving the maximum of ance, the rear springs are of a new n, two semi-elliptic arranged in the of a full elliptical, so that the ton- rides with the greatest ease, the dash ngement is new and gives a demi-ton- and roadster type of a particularly appearance. On the whole, the new s as handsome as any of its type on market.

e price, on which the makers have not decided, will be somewhere between 0 and $1,400. This will include a full , generator, magneto and tool equip- .

SULTS OF NEW JERSEY CLUB'S MEET

er 5,000 spectators attended the Fall of the New Jersey Club, at Olympic , Newark, Sunday, October 10th. er Goerke broke the track record e and captured four of the nine events off. The first time he broke the track d was during the seven-mile event h he averaged 1.15 per mile. A good ing was also made by Howard O'Brien 4 H. P. Indian. He captured the three- open and the three-mile scratch, for members only.

e summaries of the winners and best s follow:

ree-mile open—Won by Howard O'Brien an); Time, 4.11.

e-mile handicap (48.50)—Walter Goerke an); 6.13 1-5.

ss-and-out (48.50)—Walter Goerke (In- ; 4.33 1-5.

tch race (one mile)—Won by K. Moore elsior); 1.42 1-5.

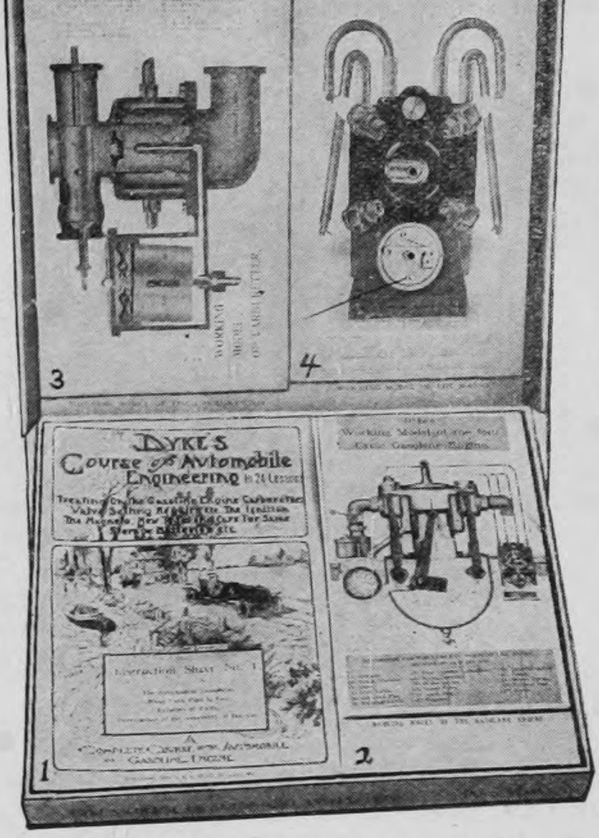
ven-mile handicap (48.50)—Walter Goerke. ch (Indian); 8.46.

ree-mile scratch (30.59)—Howard O'Brien an); 4.15 3-5.

n-mile handicap (48.50)—Walter Goerke an); 12.24 4-5.

e-mile scratch (48.50)—Won by Percy nmond (Indian); 7.24 2-5.

o-mile match race—Won by A. G. Chap- Indian); 38 3-5. The distance of this event four laps, or two miles.

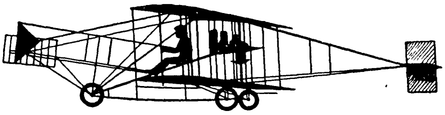


Dyke's Automobile Instruction Course.

sued by Dyke's Correspondence School of Motoring, 1400 Bank Commercial Bldg., St. Louis, Mo. In a former issue of the Journal we described the principals of the working models supplied with this course, the recent addition made being in the shape of working model of the carburetor, the same being shown in the upper left hand corner of the cut. The course is novel and unique. It consists of working models which are made up of heavy cardboard with a complete view on one side and sectional view on the other side. The course consists of 24 lessons.

W. F. Maguire, manager of the Consolidated Mfg. Co., of Toledo, Ohio, has resigned to go with the Ford Motor Co., of Detroit, Mich. He will enter on his new duties on the first of November.

¶ The North Pole has been discovered. We do not care who discovered it; but, we would like to take a look at the bearings, pretty sure to be **Plastic Bronze**, considering their cool running.

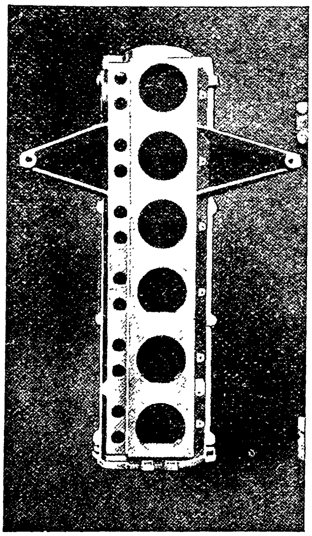


¶ Aeroplanes are flying. Curtiss has beat the lot of them. He used **Aerial Brand Aluminum** Castings; a New Brand we have just brought out for Flying Machines.

¶ While we spend time and money in developing new alloys suited to new fields of development, we still give our best efforts to our

Automobile Brand of Aluminum and Bronze Castings

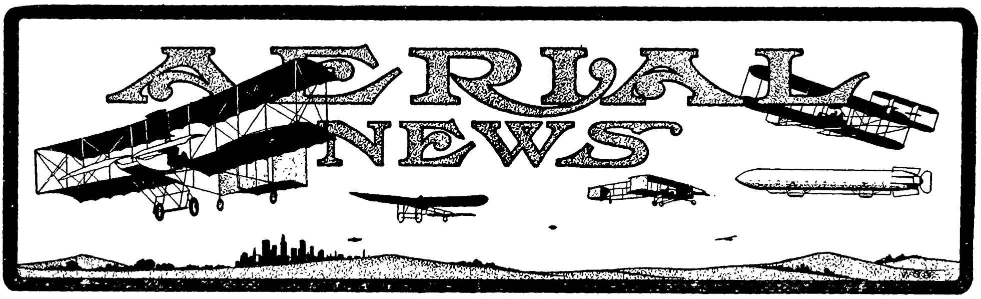
¶ These alloys have been developed not by accident, but by knowing the requirements and meeting them.



Light Mfg. & Foundry Company

Pottstown **Pennsylvania**

Sales Offices, Real Estate Trust Building, Philadelphia, Pa.



COUNT DeLAMBERT'S FLIGHT OVER EIFFEL TOWER CREATES SENSATION

On October 18 Count DeLambert, the well known French aviator, accomplished in a Wright biplane, the most sensational flight that has ever been witnessed using a heavier than air machine. Starting from the aerodrome at Juvisy, he flew beyond the confines of the field and headed direct for Paris, 13 miles away. Upon reaching the city he made several maneuvers at an average height of 400 feet, showing perfect control of the machine then ascended in gradually diminishing circles until he passed 300 feet above the top of Eiffel Tower, making a total altitude reached of about 1300 feet, he then described a wide curve and headed southward.

The astonished Parisians could hardly believe their eyes when they saw the small object gliding swiftly over their heads and far above the tower, and the sensation created by the performance was greater than that caused by the circling of the structure by Santos-Dumont in his dirigible balloon in 1901.

The Count made his return trip at good speed, the entire flight occupying 49 minutes and 39 seconds, and covering a distance roughtly estimated as 31 miles. The Count was enthusiastically received when he alighted safely in the aerodrome, and Orville Wright, who was present with his sister, rushed forward and greeted the daring Count, who was pale but radiant. Cries of "Long live Count DeLambert," "Long live Russia," Count DeLambert being of Russian extraction, were heard. The Count held up his hand and shouted, "Cry long live the United States, for it is to her that I owe this success."

About the only difficulty encountered was in seeing his landing place in the gathering gloom, the machine being under perfect control all the time. A gold medal was voted the Count by the Aero Club of France.

Anticipating that airships will be in common use in a few years the officials of Wesley Memorial Methodist Church, now nearing completion in Atlanta, Ga., instructed the building committee to so arrange the roof that there will be no difficulty in adapting it to airship landings.

WRIGHT MACHINE AT COLLEGE PARK

Wilbur Wright has been instructing Army Officers at College Park, Washington, and several flights of from 15 to 19 minutes have been made with pupils. In one of these flights, while at the further end of the field, the motor suddenly stopped. With characteristic coolness Mr. Wright took the levers from his pupil and without any difficulty caused the machine to glide lightly to the earth. Investigation revealed the fact that the gasoline tank was empty, after the magneto had been blamed for the trouble. Mr. Wright came as near laughing as he ever has and the incident shows that it is possible for him to make a mistake the same as ordinary human beings.

Several fine flights were made in the early morning before breakfast before the wind became troublesome.

CITIES BIDDING HIGH FOR 1910 AERO MEET

The cities of Washington and Baltimore have already raised the sum of $150,000 to secure if possible the International Meet of 1910, which will bring to this country all the foremost aviators and their fastest machines.

Cincinnati has pledged a large sum, Chicago is also in the field and the citizens of Los Angeles have notified the Aero Club that the Pacific Coast towns will raise a fund equal to that offered by any city in the East or Middle West.

WRIGHT MAKES RECORD OF 1,600 FEET

On October 2, Orville Wright made a record flight at Potsdam, Germany, in the presence of a large number of spectators. The weather was ideal and taking advantage of it Wright rose to a height of over 1,600 feet which more than doubles the previous record made by him.

On the same day he took up as a passenger Crown Prince Frederick Wilhelm to an altitude of about 65 feet after which the latter presented him with a diamond and ruby souvenir pin.

A prize of $500 has been offered by "Le Petit Bleu," of Brussels, to the aviator to first fly from Etterbeck to Ostend, a distance of 72 miles.

Questions and Answers

BUILDING MONOPLANE WITH GYROSCOPE CONTROLLED STABILITY

I am working on the problem of aerial craft of the monoplane type and would be very glad if you can give me the information I ask, either in the next issue of your journal or by letter.

1. What is your opinion of gasoline motors built on the revolving cylinder principle as used in the motors built by the Adams Company, of Dubuque, Iowa?

2. Are there any manufacturers in the United States that make a specialty of making wood propellers or tractors that would be suitable for use on an aeroplane?

3. Where can I get information regarding the weight and desirable speed that would be required in a gyroscope to be used to shift the balancing planes in a monoplane? Are there any manufacturers in the United States that are making electrically driven gyroscopes that have the motor self-contained in the gyroscope?

CHICAGO, ILL. HARRY S. VARLEY.

The revolving cylinder motor, built for airship work, has been demonstrated abroad to be satisfactory. We know nothing concerning the satisfaction which the Adams Company's motor has given for such work, but this company has been building engines of this type for several years for their automobiles.

You can obtain wooden propellers from R. Dressler, Coney Island, N. Y., and pressed steel propellers for flying machines from J. A. Moller, New Rochelle, N. Y. If you will write Mr. E. J. Stoddard, care of Parker & Burton, 603 Moffatt Bldg., Detroit, Mich., he will probably give you, or refer you to where you can get valuable information on gyroscopes.

We do not know of any manufacturers making electrically driven gyroscopes with self-contained motors. The weight of such a device would almost preclude its use on a heavier than air machine. We refer to the electrically driven part, as a gyroscope with sufficient power to operate the warping of the planes need not be very heavy aside from its driving mechanism. Why not operate it from the motor which drives the propeller?—Ed.

WANT NAMES OF ENGINE AND PARTS MAKERS

I note with pleasure the new department on aerial machines, it has been my pleasure for the past twenty-four years to be in close touch with improvements in all branches of mechanics, and I have watched with interest the development of the flying machine, and as in the case of steam, electricity and gas engine, I feel that I must build something.

I would like to procure in some way details of construction of some of the present types of planes, also where I could buy an engine of about 10 to 15 H. P. light, air cooled if possible, that I could use in experiments I am about to begin. Would like names of parts makers also.

NEVADA CITY, CAL. GEO. SCARFE.

In this issue of the Journal you will find some details of the construction of one of the well known heavier than air machines. A book by Major H. W. L. Moedebeck and O. Chanute, known as Moedebeck's Hand Book, might be of considerable assistance. This can probably be obtained from any large New York book company.

You can obtain suitable motors from the Herring-Curtiss Co., Hammondsport, N. Y., or from the Adams Co., Dubuque, Iowa. The Motor Car Supply Co., 1451 Michigan Boulevard, Chicago, can also furnish you motors, wood for the frame work and aluminum joints for the corners. C. A. Wittemann, 17 Ocean terrace and Little Clove road, Staten Island, N. Y., manufacturer of gliders and aeroplanes, would make any special parts desired.—Ed.

DESIRES SMALL BALOON OUTFIT

Can you give me any information about where to get the little rubber balloons usually sold at a circus and how they are inflated—want name of dealer as I am interested in getting a complete outfit. Thanking you in advance, I remain

McCOMB, MISS. J. R. LILLY.

If you will write to Samuel L. Perkins, care of Aero Club of America, 12 E. 42d Street, New York City, you will probably get all the information you desire. Mr. Perkins can undoubtedly supply you with such outfits. If you do not get what you want, kindly let us hear from you again. —ED.

AEROPLANE MOTOR MAKERS

I would like to have you give me the address of manufacturers of motors suitable for aeroplanes. Give me as many as you can.

FRESNO, CAL. SAMUEL SANBORN.

You can obtain motors of water-cooled type suitable for aeroplanes from the Herring-Curtiss Co., Hammondsport, N. Y., and air cooled motors of revolving type from the Adams Co., of Dubuque, Iowa. The American & British Manufacturing Co., Bridgeport, Conn., might also be able to supply you with a water cooled motor although not strictly an aeroplane motor. See also answer to G. Scarfe this issue.—Ed.

The Swiss Automobile Club is arranging to hold a combined automobile and aeroplane exhibition some time next Spring. Several good prizes have been offered for aeroplane flights, and arrangements are being made to have as many entries as possible.

BY D. SCRIBER.

robably no aeroplane has received more
ntion or will be more exhibited than
of Mr. Glenn H. Curtiss, with which he
the International Cup at the Rheims
t in France, during the week of Au-
22nd of the current year, thereby
ging this famous meet to the United
es in 1910. It will probably never be
l again for flying purposes, but will be
led down as a keepsake and relic to
exhibited in different cities, and finally
e to rest in some museum.

ne Curtiss Biplane, shown in Fig. 1, is
s name signifies, of the two plane or
ane type, having an upper and lower

steamed and bent to a parabolic curve, the rods or frame work running to the rear to support the rear horizontal surface and the vertical rudder and the rods running to the front to support the forward horizontal rudder or elevator, are of bamboo, joined by metal ferrules and small bolts. The only other material used in the construction is ash of which the heavy rods which support the engine are made. These are the heaviest in the machine, and give a rigid frame work for carrying this important member.

In addition to the main planes, there is a very small supporting surface at the

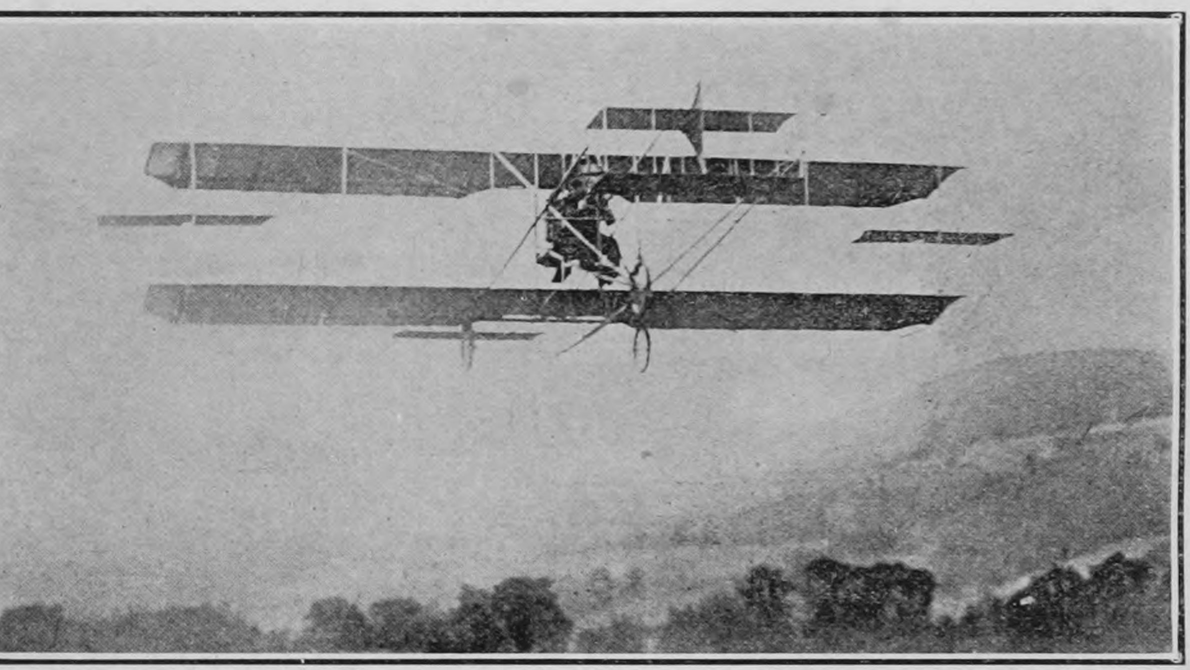


Fig. 1. View of Mr. Glenn H. Curtiss in his famous Flyer at Hammondsport, N. Y. Detailed description of
hine in text.

supporting surface. These two sup-
ng planes are about fifty-six inches
front to rear, and twenty-seven feet
vidth, and are spaced fifty-six inches
t. Each plane is made up of several
ons which permits of easy transporta-
and are not composed of canvas, but
ry fine grade of China silk, coated with
bber solution and known as double
re balloon cloth. It is light, water-
f and has considerable tensile
gth. It is stretched very tightly by
g it through eyelets in the cloth, to
aminated wood ribs which connect the
cross members forming the front and
of each of the planes. Three succes-
stretchings are required to bring the
to the required tension. The frame

rear at the centre, and at right angles to it is a vertical rudder, that is, one whose axis is vertical and which steers the machine to the right or left exactly the same as the rudder of a ship. The small horizontal supporting surface acts as a tail to steady the machine, and is smaller than those used on most of the French machines. This rear supporting surface is entirely missing in the Wright machines.

FRONT RUDDER.

At the front are two small planes arranged one above the other very much the same fashion as the main planes. These constitute the elevator or front horizontal rudder, and are pivoted so that the upper surface, the front end of the machine is depressed. In the photograph shown, one of Mr. Curtiss, trying out his machine at Hammondsport, N. Y., a small triangular vertical plane is shown between the surfaces of the front elevator. This was subsequently dispensed with as useless.

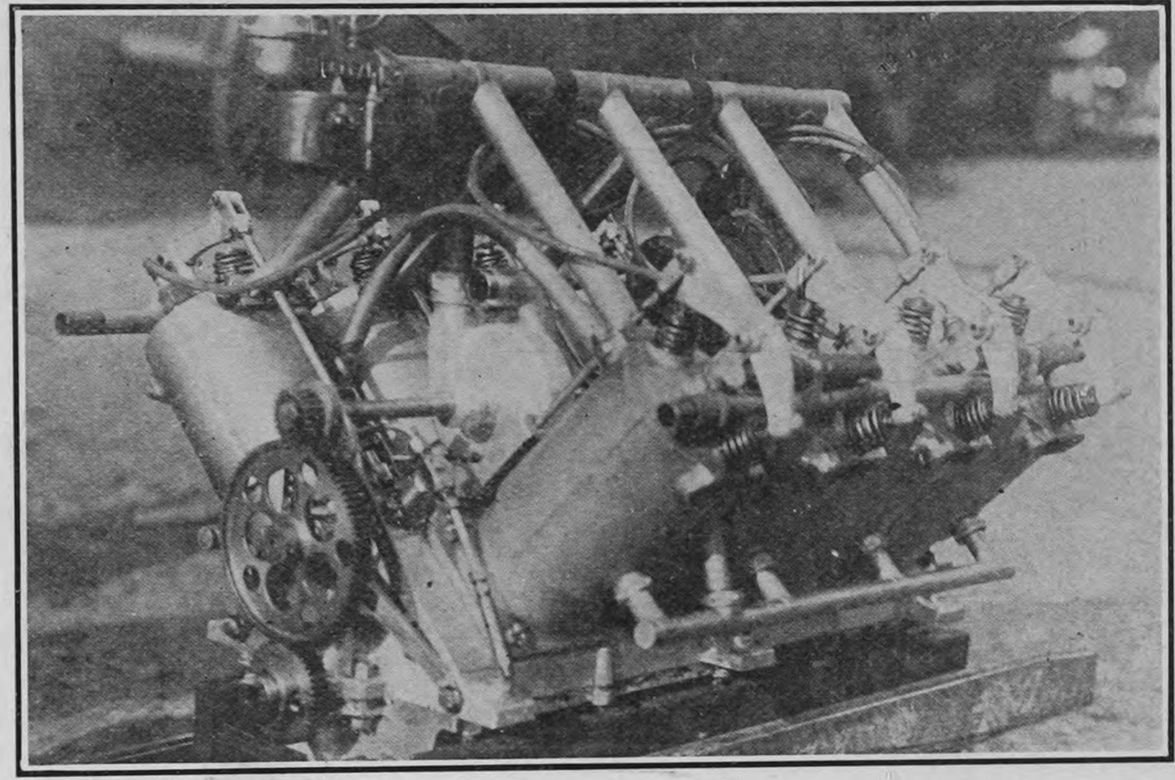


Fig. 2. 50 H. P. Curtiss 8-cylinder motor as used in the machine in which he won the blue ribbon at Rhe
This engine develops something over 50 H. P., is water cooled and weighs about 200 lbs. All 8 cylinders and
16 valves are controlled by a single cam shaft making light weight possible.

We have now mentioned the rudder for steering to the right and left and that for going up or down. There still remain two small auxiliary planes which are clearly shown in the photographs at the extreme right and left between the main supporting surfaces. These auxiliary planes are pivoted on a horizontal axis, along their front edges, and maintain the later stability or equilibrium.

GETTING INTO THE AIR.

The method of starting an aeroplane is a feature of interest. The aviator cannot start without assistance, because, as in an automobile, the motor has to be cranked, which would necessitate getting out of the machine. This cranking is done by an assistant, who grasps the propeller and turns it over until the engine starts. Other assistants hold back on the machine until the propeller gets up to seven hundred revolutions a minute, or in that neighborhood, when the machine is released, and shoots forward under the action of the propeller

faces finally becomes great enough to
port the weight of the machine, and it
not fly if going at any less speed.
ordinarily smooth ground, sufficient h
way to rise will be gained in one hund
and fifty to two hundred feet, but on ro
ground three hundred feet is often ne
sary, and over some surfaces it is im
sible for the machine to get up suffic
speed on its wheels to get off the ea
The aviator, as a rule, about the time
machine is at the proper speed to leave
ground, assists it by suddenly throwing

the forward edge of the front rud
which helps lift it. The rudder is
immediately straightened out again.

During one flight Mr. Curtiss reache
altitude considerably greater than he
intended. Turning his front rudder to
scend he found that owing to the pecu
upward current he was then in, the
chine continued to go higher. With g
presence of mind he got out of his
and climbed forward on the bamboo
so that his weight brought down the
of the machine, and he thus succeede
coming down safely.

CONTROL MECHANISM.

The control mechanism of the Cu
machine is extremely simple, and semi
tomatic, that is, the front and rear rud
are under the aviator's control by me
of a wheel which looks like an automo

Digitized by Google

the two long bamboo rods supporting the tail and connects with the rear rudder. Turning the wheel therefore swings the rudder to any desired position, giving right or left steering. This steering wheel is arranged at the end of a pole which runs forward and connects with the front pivoted horizontal rudders, so that shoving the wheel forward inclines the front rudder downward for descending, and pulling the wheel toward the aviator tips the front edge upward for ascending.

LATERAL STABILITY.

The lateral stability is made semi-automatic in an ingenious manner as follows: The seat for the operator consists of a chair bottom, the back and sides of the seat being formed of very light steel tubing. The upper tube is curved so as to touch the driver at both sides and at his back. This tube back is pivoted on the seat so that any inclination of the operator's body to the right or left carries the tubing with him, and this motion operates wire cables which connect with the right and left auxiliary planes. Thus if the wing tip to the aviator's right dips downward, he instinctively tips in the opposite direction, and this motion throws the rear edge of the right auxiliary plane downward, causing it to offer considerable more resistance to the air while at the same time it throws the rear edge of the left auxiliary plane upward causing it to catch the wind on the upper side and depress that side of the machine, quickly bringing the flyer to an even keel. This it will be seen is done without any special exertion on the part of the operator.

The motor is also under control either by means of a small throttle lever at the left of the driver's seat, or by a small lever operated by the toe of the left foot as desired. For starting, the motor is run to about seventeen hundred revolutions, and during ordinary flying is probably not turning over twelve hundred revolutions per minute, at which speed, of course, it is entirely invisible, and cannot even be caught with the camera.

Just under the toe of the right foot is a short bamboo rod tipped with a metal cap for the foot to rest against, and the other end of it arranged with a spoon brake which comes against the tire of the front wheel. This gives a means of bringing the machine quickly to a stop after alighting in case it should be headed toward obstructions or a crowd of spectators. Cut-out wires are attached to this toe brake so that pushing the brake cuts off the ignition, thus stopping the motor.

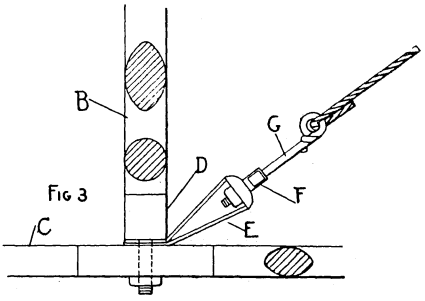


Fig. 3. Details of the method of fastening the uprights between the main supporting planes to the front and rear members of those planes, also the method of attaching the wire cables or bracing, as described in the text.

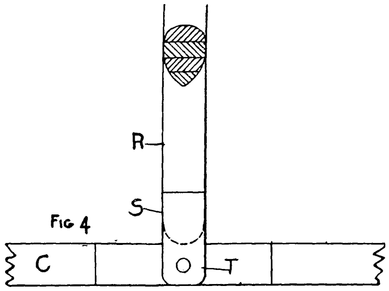


Fig. 4. Plan view showing one of the laminated wood ribs used in the Curtiss Biplane showing the ferrule made of steel tubing and flattened at the end.

THE MOTOR.

In Fig. 2 is shown a view of the Curtiss 8-cylinder racing motor used on the blue ribbon machine of the air which defeated all rivals at the Rheims meet, and was the means of bringing this contest to our own country for next year. It will be noted that the valves are in the head, both valves being operated by a single push rod and over-operated by a single push rod and overhead rocker, all eight push rods being controlled by cams, on a single cam shaft between the two rows of cylinders. This cam shaft is driven by the large spur gear which meshes with the smaller crank shaft gear below it. This ingenious arrangement saves considerable weight. The motor is rated as about fifty horse power, and weighs two hundred pounds complete. Between the two sets of cylinders can also be seen an ordinary centrifugal water pump driven by a short shaft and a gear meshing with the cam shaft gear. This pump forces water into a cross pipe which connects with headers on the lower side of each row of cylinders and supplies water to the lower portion of the jackets. The outlet for the water is at the cylinder heads and connections are made to a radiator of honeycomb type identical with those used on automobiles except of lighter design. This radiator is mounted just forward of the engine, and just to the rear of the aviator. A single carburetor of regulation float feed type is connected to a tube from which branch pipes run downward to each of the cylinders. Above the motor is a long cylindrical tank with torpedo ends which carries about five gallons of gasoline. This feeds to the carburetor beneath it by gravity. Underneath the motor base is a small lubricating tank from which oil is pumped to the crank case, splash taking care of the various parts. On the racing machines a long narrow auxiliary pump is also placed where the aviator can push it with his foot to give the motor additional oil if desired.

This light motor is the secret of Curtiss' successes, as it is extremely efficient, very compact and powerful for its weight. It will be noticed that it is water cooled, although Mr. Curtiss has been building air cooled engines for many years. This in conjunction with the leaning of the Wright Brothers to water cooled motor is a significant indication of the feeling of American aviators in this matter.

The small engine supplied on the machines now is of a new design, four-cylinder vertical with 3¾ inch bore and 4 inch stroke. It develops 25 H. P. at 1300 R. P. M. which it is claimed is the most power for the piston area yet secured in a gasoline engine. The cylinders are copper jacketed and have valves in the head. Lubrication is by a force feed pump mounted on the cam shaft and the oil forced through the hollow shafts to the bearings. The water pump is also a part of the engine and mounted on the cam shaft. Ignition is by Bosch magneto driven by enclosed gears. The engine complete with pumps and magneto weighs 100 pounds.

DETAILS OF FRAME CONSTRUCTION.

In the accompanying detail sketches are shown some of the methods of construction. A, Fig. 3 shows a detail of one of the upright supports, B between the main planes, and C one of the front members of the main planes. The upright B as shown, is of circular section near its lower end, and is tipped with a metal ferrule D which carries a threaded rod running through the cross member C, and is retained by a nut on the under side. The upper portion of piece B is of elliptical section presenting an edge to the front, its greatest depth being from front to rear. This view also shows in detail the method of attaching the stay wires. E is a metal strip the ends of which have holes through which the threaded bolt passes. F is a large sized motorcycle spoke nipple, and G is the end of a spoke coiled at the end, to form a loop through which the small wire cable passes and is soldered. This spoke nipple gives a means of tightening the stay wires as everything must be perfectly taut. This wire cable has several strands and is made of steel having a tensile strength of two hundred thousand pounds per square inch. In Fig. 4 is shown a plan view of piece C, and one of the laminated ribs R which connect the front with the rear and forms the support for the fabric of the main planes. The front end of this piece and its rear end are each fitted with a circular section ferrule S, the end of which as at F is flattened and drilled so that the bolt shown in Fig. 3 passes down through it. A section of these curved ribs is also shown. Throughout the construction the use of thin tubing is prominent, the tubes forming ferrules and the ends being flattened and drilled or the tubes being pressed into an elliptical shape to form ferrules for elliptical pieces. The entire machine is built in a neat workman-like manner, the ferrules being painted black and the wood finished in the natural color.

The regulation commercial machine is identical with the one above described with the exception of the motor, and sells for $7,500. Machines can also be had with racing motors for an additional price. With racing motor the weight complete is four hundred and fifty pounds or four hundred pounds with the smaller four-cylinder.

TO FORM COMPANY

It is reported that a company holding ownership rights in all countries has been formed for the manufacture of the Wright aeroplane, which machine is contended to be the basis of all practicable aeroplanes. The Wright brothers are said to own the controlling interest in this country, while Mr. Charles R. Flint, a merchant widely known in the South American trade, and former head of the United States Rubber Company, who is organizing the new aeroplane business, will control all foreign factories. Suits for infringement of the Wright patents have already been begun against Bleriot, who flew the "Silver Streak," against Curtiss, the American, and against all others who use any flying machine resembling the Wright aeroplane.

A legal battle to determine whether French aeroplanes which in any way use the warping wing principle infringe on the Wright patents was formally begun when the Compagnie Generale de Navigation de Aerienne, to which the Wrights sold their patents, made a "saisie-descriptive" of aeroplanes on exhibition at the Aeronautic Salon, Paris.

A "saisie-descriptive" does not involve the seizure of the machine, but is a process whereby an official description of a machine is recorded for the future benefit of the court and constitutes in effect an injunction.

Parisian dressmakers are now perfecting a suitable sky costume for progressive women who motor on high. The costume does not include skirts, but instead canvas Knickerbockers, army puttees and strong shoes. A woolen sweater, waterproof hood, automobile gauntlets and goggles if necessary, complete the costume.

As a "sign of the times" we find the foreign toy shops are full of actual working models of the various airships—some of them having real gasoline motors, making long flights, costing about $60.

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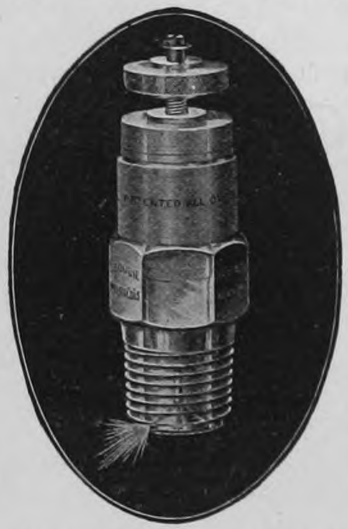

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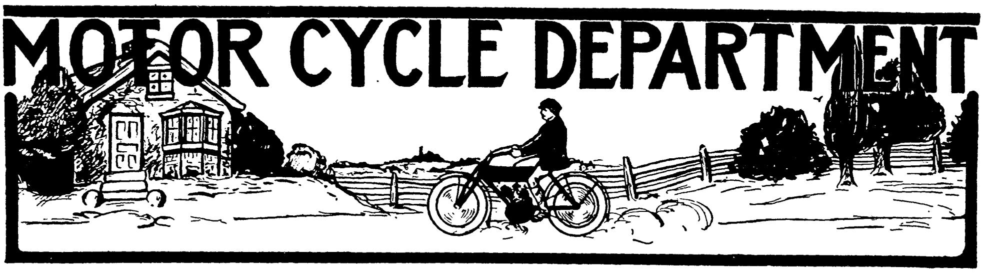


MOTOR CYCLE DEPARTMENT

EDITORIAL

THE MOTORCYCLE TANDEM ATTACHMENT

Many motorcyclists after having become accustomed to their steeds desire to take friends along on their trips and not being desirous of attaching a tri-car, have recourse to the tandem attachment.

Many riders of a mechanical turn of mind construct their own attachments from old bicycle handle bars and extra saddles while others buy the outfit complete, ready to attach, there being several on the market. In either case the attachment is usually placed on the machine without giving the latter any preliminary examination and immediately given a trial. If nothing happens during this tryout it is taken for granted that everything is all right and no further attention is given to the device and the motorcycle itself until the unexpected happens, which usually occurs far from home and many times results in the rear wheel being badly damaged. We do not wish to discourage the use of a tandem attachment but on the contrary think it furnishes an ideal method of carrying an extra passenger, provided, however, the machine to which it is attached is first examined to ascertain whether or not it or more particularly the rear wheel is capable of standing up under the extra load.

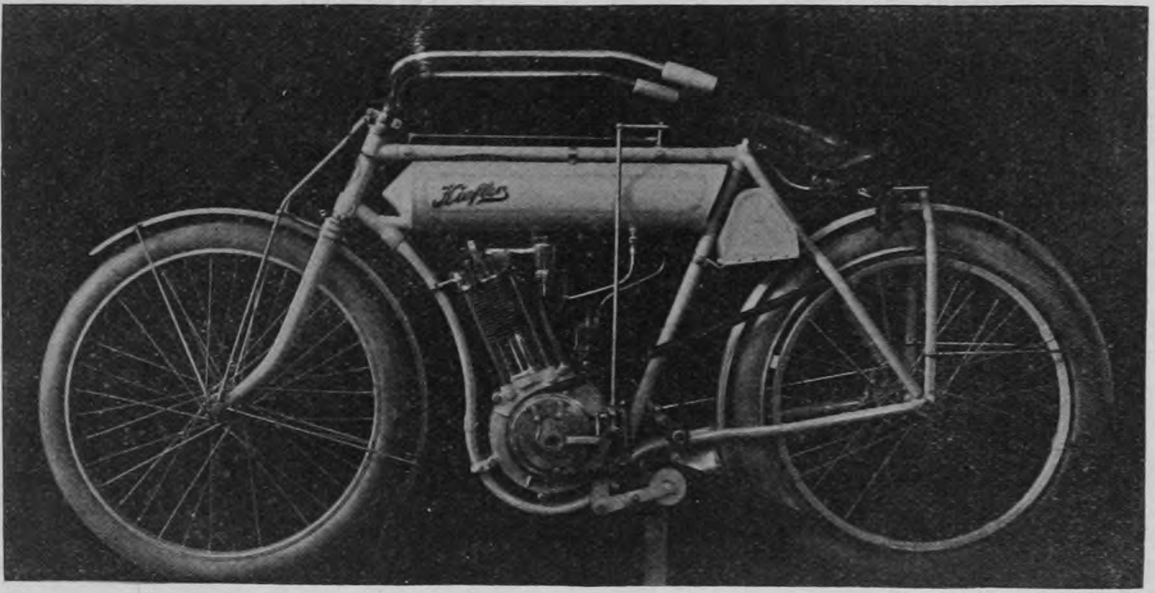
It must be remembered that motorcycles ordinarily are not built for carrying two passengers and that the extra weight, an average of 130 lbs., puts an undue amount of strain on the spokes of the rear wheel and this strain is increased as the distance that the tandem saddle is set back of the rear axle is increased; in other words, the further back the extra saddle is placed to the rear of the back axle the more direct weight is placed on the rear wheel, whereas if placed forward the extra weight is distributed more evenly and the front wheel gets its share of the weight. Care should therefore be taken that all spokes are tight and all bent or rusted ones should be taken out and replaced by new ones. If the spokes are of the thin variety as on some of the earlier models, the same should be taken out entirely and heavier ones substituted. Attention should also be paid to the proper inflation of the rear tire and under no circumstances should a tire be ridden half deflated or with a slow leak. The latter defect would not be noticed at first, but after riding a short time the extra weight will slowly soften the tire, with the result should the rear wheel strike a stone or obstruction in a sandy or deep dirt road, that the impact would twist the wheel rim or tear out some of the spokes.

When two persons are riding on a motorcycle, care should be taken to take the curves slowly and in as large an arc as possible, as there is a tendency for the rear wheel to skid unduly, especially if the roads are the least muddy or even wet, and on the turns the greatest strains are given the mechanism due to the extra load. Machines can often be successfully used to carry double if a reasonable amount of care is exercised, and much pleasure results, but too often they are racked and permanently injured by using tandem attachments without properly preparing the mount to receive them.

Fischer Makes Fast Time—At the recent state fair in Milwaukee, Wis., Oakley Fischer rode a five mile exhibition before a huge crowd. Although the track was in bad condition due to the fact that horse races were run previous to the motor cycle exhibition, still Fischer managed to reel off the distance in 4.38. His best mile, the second, was made in 52 seconds, which is very fast for a flat track.

Billy Chadeayne, of the Greyhound Motor Works, Buffalo, who is well known in American motorcycle circles, has just returned from an extended European pleasure tour on a Greyhound. He and a companion covered nearly 4000 miles through England, Ireland, Scotland, France, Switzerland, Germany, Belgium and Holland. After landing in Boston Chadeayne rode his Greyhound back to Buffalo by way of New York. He had no engine trouble, nor, in fact, any trouble aside from the minor incidents of the road on any such trip.

The Kiefler mortocycle which is built y the Kiefler Motor Works, 184-6 Broad- vay, Buffalo, N. Y., is made only in single ylinder type.

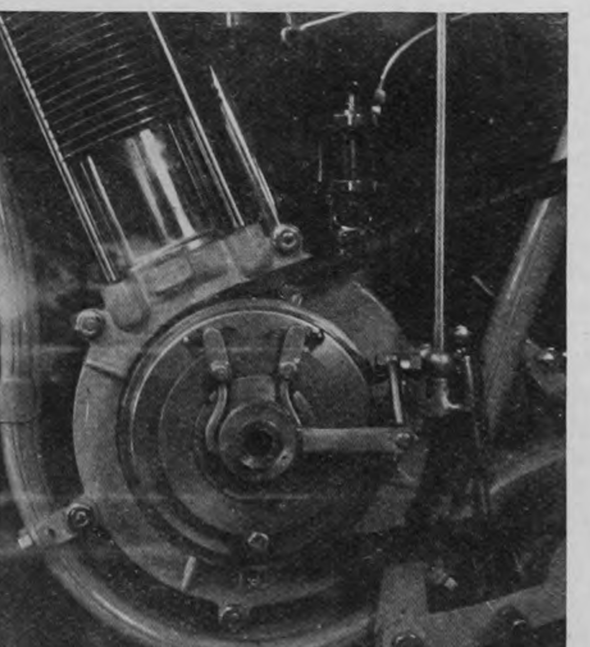


The "Kiefler" 5 H. P. Single Cylinder Motorcycle; two speed gear; drive by chain belt; wheel base 53 inches; 28-inch wheels; tires 2½ inches; 1½ gal. gasoline tank and 3 pt. oil; frame is of double loop type; price with direct drive $225 and with two-speed gear $260.

The motor is rated at 5 H. P. and is of he slow speed type. The cooling flanges re cut from the solid, making it possible o secure very thin and deep flanges. The ntake valve is automatic and is mounted irectly over the exhaust valve. All shafts n the motor are 1 inch in diameter. The riving pulley is dished so as to bring driv- ng belt directly over the center of the haft bearing doing away with side fric- on. Lubrication is automatic through ght feed cup. The frame is of the double loop type. Ignition is by two standard dry cells. The batteries and coil are incased in a metal case mounted in rear of seat post mast.

Drive is by chain belt. The tension is regulated by automatic idler, with pin on same to slacken tension on steep hills or on rough roads. Spark and throttle control is by friction levers. The ignition can be cut out from left grip and motor compression used for slackening speed. The rear hub is plain with steel brake disc on which is mounted contracting brake band 4¾ in. dia., 1 in. wide, lined with bronze giving metal to metal friction surfaces. This brake is operated by foot lever, which is mounted on a tubular foot rest across lower front stays, as there are no pedals. The saddle is mounted on an auxiliary rear stay which gives low riding position.

Gasoline and oil are carried in a double compartment torpedo tank which is mounted between the truss tubes. The tank holds 1½ gallons gasoline and 3 pints oil. The wheel base is 53 ins., 28x2½ in. tires are fitted. The two speed gear gives a ratio of 4 to 1 on high speed and 9 to 1 on low. The low speed revolves on 76 ¼ in. balls, while on high speed the whole attachment revolves as one piece; when lever is put in nutral engine is free. Motor can be started with crank. Both clutches on gear are of the circular contracting band type, which does away with side thrust on bearings. The low speed is adjustable with a cone like a hub. All wearing parts are hardened and ground.



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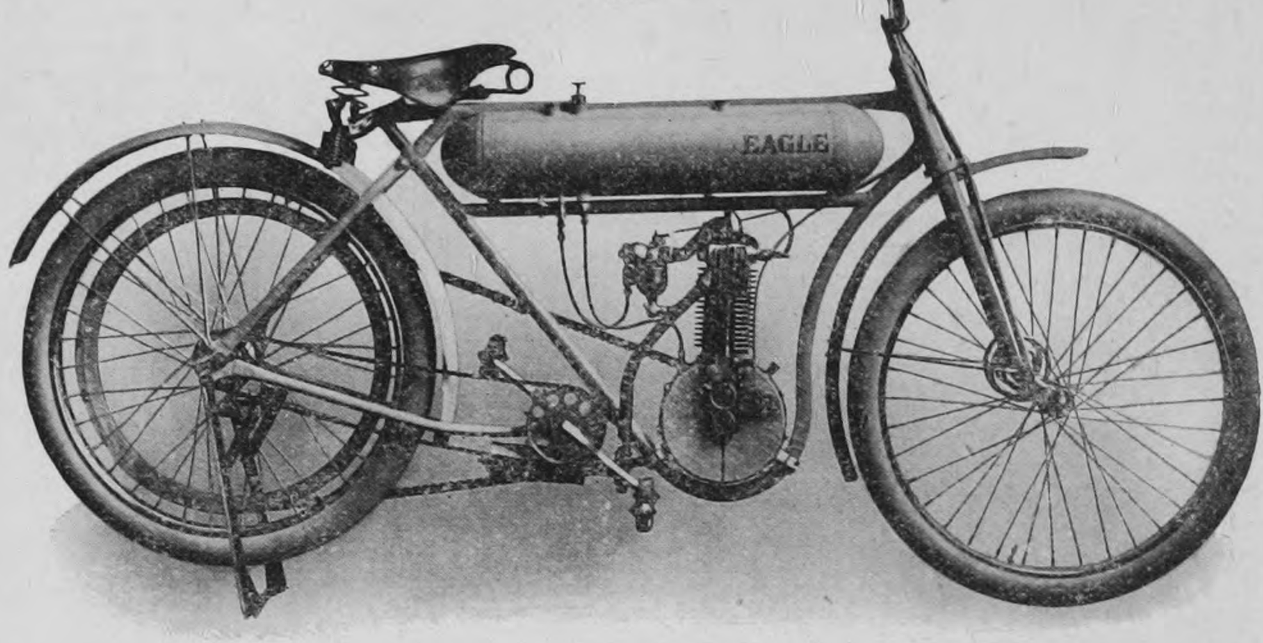


The "Eagle" 3 H. P. Motorcycle, Model A; bore 3 ins., stroke 3½ ins.; 56-inch wheel base; 28x2½ inch tires; finish French Gray; price $185.00.

THE "EAGLE" MOTORCYCLE

The Eagle motorcycle illustrated herewith is manufactured by the Eagle Motor Works, 1111 E. Franklin avenue, Minneapolis, Minn.

The cylinder is cast from the best grade of grey iron and is provided with large flanges to give ample cooling surface. The bore is 3 inches and the stroke 3½ inches. The intake and exhaust valves are 1½ inches in diameter. The spark plug is set in the side of the valve chamber. The fly wheels are 8½ inches in diameter and the main shaft runs in long phosphor bronze bearings. The connecting rod is a drop forging. The crank case is of aluminum and is held together with 9 bolts. The piston is fitted with two rings, which are accurately fitted.

The timer is operated by means of a Bowden wire running from the right hand grip, while the left hand grip operates the throttle by means of a Bowden wire. The Schebler automatic carburetor is used.

The front fork is of new design. As will be seen from the illustration, it has two springs one on each side held by means of bolt studs and arms securely clamped with a ½ inch axle through front hub.

The frame is made of 1⅛ inch tubing. The head is of 10 gauge tubing while the engine is 16 gauge and the rest 18 gauge. The wheel base is 56 inches and the wheels are 28 inches in diameter fitted with 2½ inch, Kokomo or G & J tires. The Corbin coaster brake is used. Either a rubber or leather ⅞ inch V belt is fitted. The gaso-

spark coil. The finish is in French gray The price of Model A is $185. This cor cern also builds a 4 H. P. machine, calle their Model C which lists at $210.

THE 1910 GREYHOUND

The 1910 Greyhound shows a radical de parture from all previous models manufac tured by the Greyhound Works, 1443 Nia ara street, Buffalo, N. Y. It will be see from the cut that the motor is mounte vertically, and the fly wheel is much large than heretofore. The cylinder has 3 inch bore and 3⅝ inch stroke which make a piston displacement of a fraction les than 30.5. A well shaped combination tan is used carrying gasoline, batteries, coil an oil, and a spacious tool box is provided i the lower triangle of the frame. The con trol is of the double grip type, the connec tions leading through the handle bar an frame head. The well known Greyhoun shock absorber is retained and is suppl mented with a new cushion front fork. A exceptionally fine oiling device is claime for the 1910 model, the oil route being care fully and scientifically figured out. Th standard finish of the Greyhound is gra enamel in consonance with the name, blu striping being used for relief. The ma chine is fitted with a stand, 2½ inch tire rubber pedals and full equipment of nece sary tools.

The Motorcyclists' Protective Associ tion has been formed in Los Angeles, Ca

The accompanying cut shows the front spring fork as used on the Greyhound motorcycle, built by the Greyhound Motor Works, of Buffalo, N. Y., and which conorms to the principles mentioned in our editorial on front forks in the September

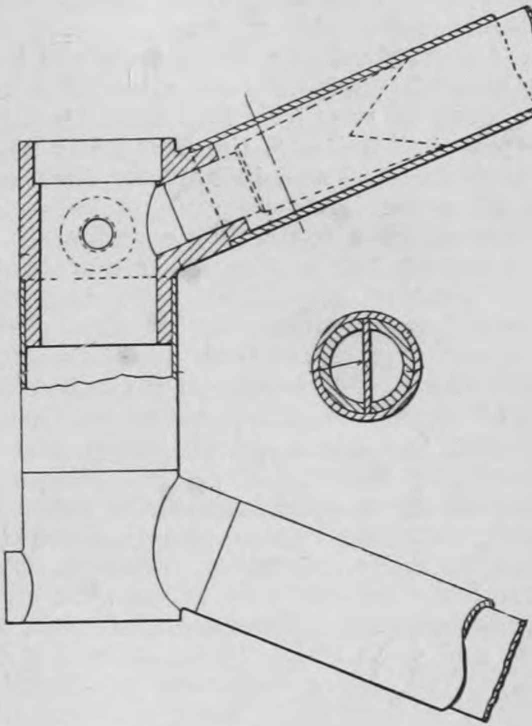
The "Greyhound" Front Spring Fork.

ssue, page 187. It will be seen that under the weight of the rider the position of the rocker bars at the front hub is such that when any obstacle is encountered by the front wheel the direction of shock is at a right angle to the rocker bars, so that the wheel instantly and easily swings upward and backward and the shock is absorbed by the heavy coil spring at the head. It should be noted that there is action at only two points in this fork—at the rocker bars, which play in ball bearngs, and at the telescope tube containing the spring.

Harry Cunningham, of Beaumont, Texas, recently established a record for continuous road riding, when he covered 560 miles in twenty-one and a half hours. He rode a Harley-Davidson, and averaged 26 miles an hour.

The Reliance Motorcycle Co., of Oswego, N. Y., is building a large addition to its factory and expects to put its new car on the market in the spring of 1910. The car which this concern will bring out will

Carl O. Hedstrom, of the Hendee Mfg. Co., Springfield, Mass., has recently patented the motorcycle frame construction illustrated herewith. The object of the invention is to so construct such a frame, and especially the joint portion that connects the brace bars to the steering head and crank hanger that it will be extremely rigid.



Sectional views of the Headstrom Motorcycle Frame.

The gist of the invention consists in strengthening or reinforcing the frame by the use of a longitudinally arranged plate in the various tubes or brace members, which plate is brazed into supplemental stubs on short pieces of tubing that accurately fit the interior of the outer tubes, whereby when the whole structure is brazed together, these longitudinal ribs or plates serve to greatly strengthen the frame, both as to longitudinal and transverse strains.

The cut shows a sectional view of the steering head and the upper brace bar of the frame. This view clearly shows the manner in which the bracing web or plate is secured to the inner tubular stub.

The Chicago Motorcycle Club recently moved from its old quarters at 267 Michigan avenue to 3259 Prairie avenue, wherein its new seven-room club house it has fitted up a meeting room, committee room, pool, card and reading rooms.

W. D. Hart, of 205 Parkman street, Warren, Ohio, expects to locate in the bicycle

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MOTORCYCLES DO MORE THAN 1,000 MILES IN TWICE AROUND THE CLOCK RACE.

Charles Spencer and Charles Gustafson, both of Springfield, Mass., on October 2nd, completed a 24-hour race on the Springfield Stadium. Both rode 5 H. P. twin cylinder Indian motorcycles and used the same machines from the start to the finish. They averaged from 35 to more than 55 miles an hour and Spencer completed the race with a record of 1,089 miles, while Gustafson rode 1,043 miles.

Both started off at a lively pace and kept together, wheeling off mile after mile in a little over a minute. The first 10 miles were covered in 10.18, the first 25 in 26.25, 50 miles in 53.20 and in an hour they covered 57 miles. At the end of 140 miles Spencer stopped for gasoline and after he had covered 144 miles, his chain broke. At the end of his 222nd mile he again stopped for gasoline. During this period Gustafson also stopped for gasoline and a broken chain. At the end of his 222nd mile Spencer was four miles ahead of Gustafson, then his chain broke again and so jammed the mud guards into the rear forks that quite a little time was taken for repairs, during which time Gustafson gained 13 miles. Spencer, however, made up for lost time and tore around the circle at a furious pace. The race started at 4.15 P. M., and until about 2 or 3 o'clock in the morning the riders were very comfortable, the only disagreeable feature being stiffness in their necks. In the early morning the dampness made itself felt, making it very unpleasant for the riders. Short rests were taken and the men were rubbed down and given very little refreshment. Spencer did not eat until he had ridden 12 hours, when he took a rest of 31 minutes. After going over 973 miles, it was noticed that Gustafson was very fatigued and was requested by his attendants to come off the track, but he refused stating that he wanted to cover at least 1,000 miles. At the 1,086th mile both men had only three minutes to go, and began hitting it up to the high speed mark. They passed the tape twice, rim to rim, and when at last the pistol brought the men off the track, Spencer left his mount considerably stronger than was expected, while sleep told on Gustafson.

SIX-DAY MOTORCYCLE RACE A FAILURE

The six-day motorcycle race, scheduled to take place the week of September 26th, at Brighton Beach, was a complete failure. The event was to be conducted by the Motorcycle Contest Association, of New York, under the management of John Kane Mills. The race was called off on account of several unforeseen obstacles. One was the unobliging weather which, from midnight until about noon, was ideal. About that time it started to rain and by 1.50 the race was postponed until 5 o'clock as the track was unrideable. Owing to the condition of the track, the steady downpour of rain and the absence of any spectators, the race was called off for good.

Answers to Motor Cycle Questions

(We desire not only our readers to make full use of this department, but any one who disagrees with the opinions herein expressed.)

THE FASTEST MILE

I have a friend who seems to be under the impression that Glenn Curtiss of the Herring-Curtiss Motorcycle Co., Hammondsport, N. Y., once made a mile on a motorcycle in 26 seconds (twenty-six seconds) thereby giving him the right to say that he has traveled faster than any human being in existence.

I say that he is mistaken, basing my statement on the fact that several years ago on the beach at Ormond, Florida, the Stanley Steamer made a mile in 26 1-5 seconds.

I am inclosing you a page from your journal which states that the best record for 1 mile in a gasoline car is 28 3-5 seconds. Please advise me concerning the above and please give me the best time ever made on a motorcycle for one mile.

SMITHVILLE, N. J. A. HOLMES HOWE.

Glenn Curtiss, the same that is now prominent in aviation, is reported to have made a mile straight away at Ormond Beach, Fla., in 26 2-5 seconds on a 40 H. P. 8-cylinder motorcycle of his own make, this being the fastest mile ever recorded as far as we are aware.

The record for the Stanley Steamer on the same beach was 28 1-5 seconds not 26 1-5 seconds as you had it. The best time for any gasoline car is two miles in 58 2-5 seconds made at Ormond Beach, January 30, 1906, by Demogeot in a 200 H. P. Darracq.—ED.

TWO SPEEDS AND FREE ENGINE

[517.] Please let me know what they call two speeds, free motor and how long does it take to charge an electric runabout?

MERRICK, MASS. ROBERT G. PATTISON.

If the engine is connected directly to the driving wheel by chain as in some motorcycles there is but one speed. The motor and the wheel it propels bear the same relation to each other all the time. If, however, there is a clutch so the motor can be cut free from the wheel and allowed to revolve without driving the vehicle, it is a free motor. All autos are free motor devices so this term is not much heard except in connection with motorcycles. If there is another chain and set of sprockets which can be used, the ratio of the engine turns to the turns of the driving wheel is different and this makes a second speed. Most autos have two and three speed ratios.—C. E. D.

MOTOR RATHER LARGE

[491] I would like to ask you a few questions in regards to building a two-cylinder motorcycle motor about 7 H. P. The bore is 3½ inches in diameter and 3¼ inch stroke. What compression space should I have for this size bore and stroke? What size should the exhaust valve be and what the lift should be to prevent overheating. Would a valve 1⅜ in. diam. be large enough? How much should the fly wheel weigh? Would the wall of the cylinder be thick enough if 5-32 inches? What size inlet pipe would you advise to carburetor?

PATERSON, N. J. L. BAUM, JR.

Your list of questions is such that we would practically have to design your motor. This, of course, we cannot do in our columns, but will say that 3½ inch by 3¼ is rather large for two cylinders for a motor cycle. Your compression space of ⅞ of an inch, is, if anything, too large; ⅝ would be sufficient. The exhaust valve if given a good lift will do. The fly wheel should weigh as light as possible to keep the total weight down, but should be at least 20 to 25 lbs. I should advise with carburetor makers as to the best size carburetor and inlet pipe to use. 5-32 inch is too thin for the cylinder walls; make them ¼ inch or more.—Ed.

MOTORCYCLE FOR MAIL CARRIER

[514.] Will you kindly answer the following questions for me in the motorcycle columns:

1. Would a high grade, 4 H. P. motorcycle be capable of carrying its rider, a mail bag, and a few packages against a very strong head wind?
2. Would a good, powerful motorcycle be reliable and dependable enough to be used by a mail carrier on a rural route; the roads being good?
3. What are the chief objections to the using of 2-cycle motors on motorcycles?
4. Do you think that these objections can be overcome? If not, please give your reasons.

GOODNOE HILLS, WASH. U. S.

Any up-to-date machine of four horsepower would be suitable for mail carrying and also if overhauled regularly and kept in condition would be perfectly dependable. One of the chief objections to 2-cycle motors is the fact that they cost a large amount of money and much time to develop a satisfactory one and very few engineers have been able to turn out 2-cycle motors which would compete with the 4-cycle. They are essentially slower speed engines than the 4-cycle and, therefore, not as well adapted to motorcycle use. However, a few are reported to have made 2000 to 2500 R. P. M. which is plenty high enough. These objections can largely be overcome, but it will require years of study and experiment on the part of the makers to develop a perfectly satisfactory engine, while any ordinary mechanic can turn out a 4-cycle engine which will give fairly good results and be much less expensive. A 2-cycle engine in its simplest form can be manufactured for much less than a 4-cycle, but the expense is in developing a suitable design. There are so many poor 2-cycle engines turned out for marine purposes that many buyers are skeptical and rather than take chances, prefer to purchase 4-cycle motors. The 2-cycle engine will come into its own some day and indications are that that time is not nearly so far distant as was supposed three years ago.—Ed.

MOTORCYCLE ENGINE COMPRESSION

[524] I have a Thor motorcycle, 3¼ H. P., Model C. Will be obliged to you if you will answer me a few questions. Why does my engine have more power when cold than when warm? It runs better on a cold day or when I just start out with cold engine. I use heavy Panhard Oil. Should the compression be as good with warm engine as when cold? As these engines are built for high speed, what must we do to maintain the speed? As the machine gets colder the speed drops lower. Does a tight automatic inlet valve spring reduce the power or speed? I have lowered the level of my carburetor as far as I can; it does not flood when standing but floods when I coast, so the engine must draw on the carburetor from 8 to 15 times before it will fire. I have ground the needle valve.

HOMEWOOD, PA. G. J. H.

There is something wrong with the design of your engine or your oil is not what it ought to be, or the engine is out of order somewhere. There are so many things to consider. I have known engines to leak badly when cold, but be tight as bottles when warmed up. They seemed to warp and the rings had been run long enough to fit properly when the engine got hot, but when cold they did not fit. The reverse can be easily true. The probability is that the thick cold oil packs the leaks well and the engine is tight when cold, but the oil gets too thin and does not pack when the engine gets hot. I have had users say they got a third more power by using a heavy high fire test oil. The strength of the spring must be according to the weight of the valve and its lift. I believe in short lifts, large valves, light weights and light springs. The light spring lets in the new charge easily, but if the valve is so heavy as to be slow in action the charge gets out again. The light valve is doubly valuable because it can lift easily and close easily. Your engine has probably lost compression. This will cut down the speed and power. A high compression suffers more from a leak than does a low compression engine. —C. E. D.

IS SHAFT DRIVE PRACTICABLE?

[511] I would greatly like to hear your discussion on the shaft drive as applied to motorcycle. Your opinion on the questions below will be appreciated.

Is the shaft drive as applied to motorcycles practicable on Thor type of motor? Do you believe the cost of manufacture to be one of the reasons that it is not more widely used on American machines? Do you not think that it would be a success if it were applied on such machines as the Indian, R. S., or Thor?

NEW YORK. S. BUSCH.

We see no reason why a shaft drive cannot be used with the Thor type of motor, but this would probably necessitate changes in the crank case and crank shaft design. The shaft drive is perfectly practical as has already been demonstrated by both foreign and American-made machines.

The cost of manufacture is undoubtedly one reason why the shaft drive has not been more often used, but the irregularity of the impulses given by a single cylinder motor is another reason why the shaft drive has not been more extensively used. With a multi-cylinder engine the torque is more uniform. With a single cylinder engine some form of friction or spring absorbing device should be placed between the engine and the shaft.

WANTS TWO-CYCLE WATER-COOLED MOTORCYCLE

[529] Am contemplating building a two-cycle water-cooled motorcycle and would like to ask of you which would be the better plan, to have the flywheel inclosed in the crank case, or on the outside?

(a) Would a 3½x3½-inch motor be large enough, and approximately how much H. P. would an engine of this bore and stroke develop?

(b) By mixing lubricating oil with gasoline, does it lubricate the entire engine, even the crankshaft bearings, or would it be necessary to have compression cups for these bearings?

(c) In the syphon principle of water cooling, does the cylinder have to be below the lowest point of the radiator?

(d) Do you know of any engine builders who make an engine such as I want?

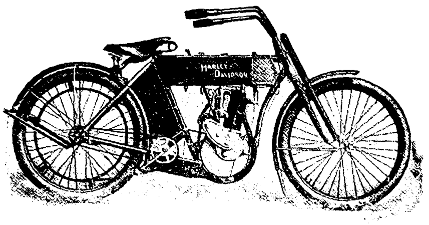
HUNTINGBURG. IND. C. M. DOWELL.

(a) A single cylinder 3½x3½ 2-cycle ought to develop at least 6 H. P. and would be ample for any motorcycle.

(b) Placing lubricating oil in gasoline tank lubricates all of the motor that the mixture reaches, including crankshaft bearings.

(c) There is no "siphon" action in water cooling without a water pump. "Thermal circulation" is the term. The bottom of the radiator water should be at least an inch below the bottom of the cylinder water jackets, car standing level.

(d) Motorcycle Equipment & Supply Co., Hammondsport, N. Y.—H. D.



THE STOCK MACHINE IS THE MOTORCYCLE THAT COUNTS, and the

HARLEY-DAVIDSON

has conclusively proved that it is without an equal in this class.

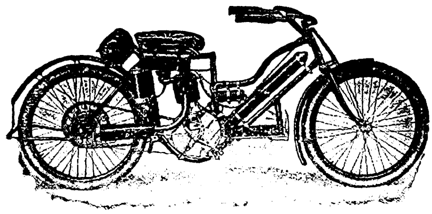
Some Recent Stock Machine Victories:

Milwaukee, Wisconsin, September 25th
Fort Collins, Colorado, September 29th.
Norton, Kansas, September 30th.
Milwaukee, Wisconsin, October 2nd.

WON EVERY RACE ENTERED

HARLEY - DAVIDSON MOTOR COMPANY
MILWAUKEE, WIS.

NEW ERA AUTO-CYCLE
TWO SPEEDS, FREE MOTOR, HAND-CRANKED MOTOR



The New Era Gas Engine Company
7 Dale Avenue, Dayton, Ohio

Thor

THE
MOTORCYCLE
SUPREME

THOR IV

SINGLE

¶ The Greatest Motorcycle ever presented to the Public. Look for it at the following Shows:

Atlanta, Ga., November 6th to 13th, 1909.
New York, January 8th to 15th, 1910.
Chicago, February 5th to 12th, 1910.

In the meantime, write and secure agency. It's a money getter.

AURORA AUTOMATIC MACHINERY CO.

Thor Building, 1307 Michigan Ave., CHICAGO, ILL.

Talk No. 2

To The "Live" Agents In Unoccupied M. M. Territory

In our last advertisement in this paper we talked about our 1910 plans. That talk was convincing. It was fact, every word of it. And we have been busy ever since answering questions. It seems a difficult matter for many persons to believe that we — or any other motorcycle manufacturer — can afford to spend from $35,000 to $50,000 in an advertising campaign for 1910. We shall be specific. But first just a few words about the new M. M.

It is one corking good machine. There is not a thing on the market that can touch it with a ten-foot pole. We've had it out on the road—and we know. Every new feature has been thoroughly tested out, and the old ones have been improved. What is more, in one month from today we shall begin to make deliveries.

If the machine was not good enough to have our whole-hearted backing we would hesitate a long time before announcing an advertising and selling campaign of the magnitude we contemplate. But **the** machine is here. We have the utmost confidence in it. We know it will make good, and we'll back it to the limit.

Past experience has fixed the fact that we can spend $10 for advertising on each motorcycle we manufacture. We have ordered castings, forgings, etc., enough to build 3,000 machines of one model and 500 of another. These 3,500 machines will give us our minimum of $35,000 for advertising purposes. We fully expect the demand for M. M. will exceed this number by many hundred. We hope it may be another thousand. Every additional motor made gives us another $10 to spend.

This minimum of $35,000 will be spent all over the country. The trade papers will get some of it. Magazines devoted to outdoor life, such as "Field and Stream," "Recreation," "Outing," "Country Life" and others will carry M. M. advertising. The general magazines, both monthly and weekly, "Saturday Evening Post," "Collier's," "Everybody's," "Munsey's" etc., will also carry considerable of it. During show seasons and other special times the daily papers will get their share.

All of this is bound to sell M. M. Motorcycles. The factory is there with the goods—the machine that will make them all sit up and take notice. And a good machine, backed with a liberal advertising campaign, can't be anything but a successful seller. Our advertising is going to help us sell our output, but it is going to help our agents as much as it will us. As an M. M. Agent you will get the direct returns from every dollar we spend.

Our proposition is good. Good enough so we can select our agents. We want live men—hustlers who can make money for themselves and us. There is territory aplenty. Some of it where the riding season lasts all the year round. Get in now. Make up your mind at once, and write us immediately.

AMERICAN MOTOR COMPANY

715 Centre Street, Brockton, Mass.

DISTRIBUTING STORES:

American Motor Company, 218 Clarendon St., Boston, Mass.; Geo. P. Jenkins, 10 W. 60th St., New York City; L. E. French, 895 Main St., Buffalo, N. Y.; G. M. Greene, Mgr. Am. Motor Co., 1536 Michigan Ave., Chicago, Ill.; American Motor Co. of Texas, M. M. Building, Dallas, Tex.; Lincoln Holland, 1034 So. Main St., Los Angeles, Cal.

Now Then!

We present the 1910 GREYHOUND with all the enthusiasm of the positive belief that it is the best and most efficient motorcycle of its class in the world!

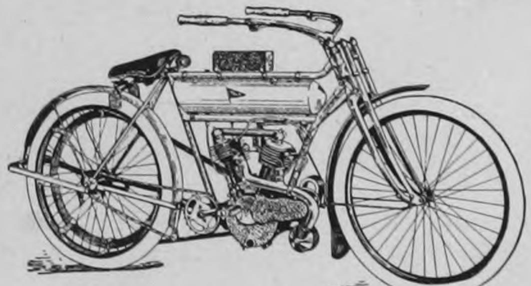
4½ H. P.,—large fly wheel in aluminum case—combination tank for gasoline, batteries, coil and oil—double grip ontrol—perfect oiling system—**GREYHOUND Patent Shock Absorber,** the finest comfort device ever aplied to a motorcycle and a new cushion front fork that is equally good—all equipment of the best.

See it at Atlanta and other big shows. Catalog Free. Interesting matter for good agents.

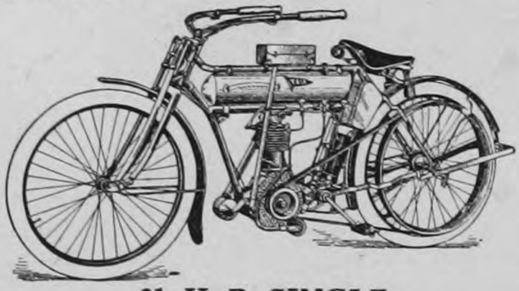
GREYHOUND MOTOR WORKS :: 1453 Niagara St. :: Buffalo, New York

Member Motorcycle Manufacturers Association

1910 YALE MOTORCYCLES
ARE BEING DELIVERED



6½ H. P. TWIN
S. G. V. belt. Bosch magneto, $300.



3½ H. P. SINGLE
Flat belt and idler, battery ignition, $200. S. G. V. belt optional. Herz magneto, $35 extra.

- ¶ The Yale Motorcycle holds the **World's Record** for **Endurance,** and has **made good** in every test, no matter how severe.
- ¶ The Yale Motorcycle is operated at less **upkeep expense** than any other.
- ¶ The Yale Motorcycle is ideal for touring and business, because it runs **all the time** and is **free from trouble.**
- ¶ The Yale Motorcycle agency proposition for 1910 is very **attractive.**

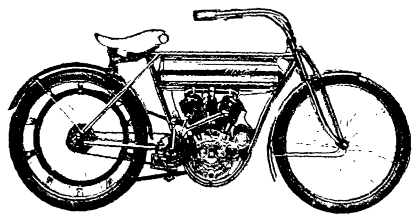
IMMEDIATE DELIVERIES. WRITE FOR INFORMATION

Will exhibit Atlanta Auto. Show, November 6 *to* 13, *space* 84 *E in basement*

The Consolidated Mfg. Co., 1710 Fernwood Ave., Toledo, Ohio

Merkel Comfort

SPRING FRAME

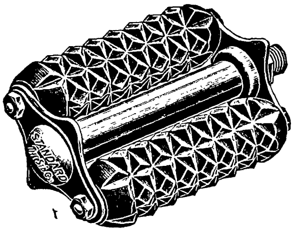


SPRING FORKS

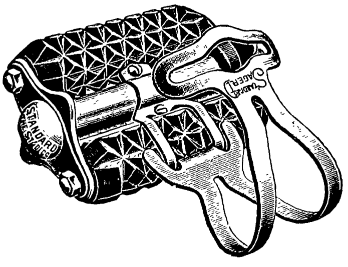
Fast :: Powerful :: Comfortable :: Reliable

That's what YOU want, Mr. Rider!

Merkel-Light Motor Co., Pottstown, Pa.



Standard Motorcycle Pedals



Standard Sager Motorcycle Toe Clips

The Majority is Usually Right

¶ **The test of time is always proof.**

¶ After many years **Standard Motorcycle Parts** have become known as **Standard** throughout the world, and they are found as high-grade equipments on the largest number of machines.

¶ **Standard Pedals** combine strength with lightness. The rubbers have deep corrugations which hold the foot firmly and absorb vibration. The rubbers may be turned, thus presenting new surfaces for wear.

¶ **Standard Sager Toe Clips** hold the foot securely without undue pressure. They are popular because comfortable, strong and neat.

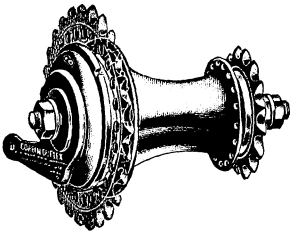
¶ We also manufacture a complete line of **Spokes** and **Nipples, Bridgeport** and **Star Pedals**, on which it will pay you to get prices. The famous **Breech Block Spark Plug** is one of our products.

The Standard Co., Torrington, Conn.

Ask for Corbin

¶ Built throughout for motorcycle use. Inside diameter of brake drum, 3 inches, with shoes ½ inch wide, giving more braking surface than any other coaster brake.

Corbin Motorcycle



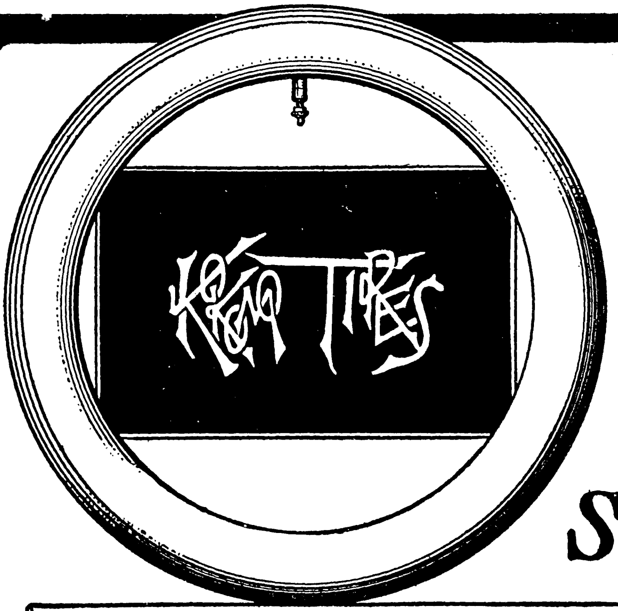
Coaster Brake
Model 9

¶ Made for either chain or belt drive motorcycles, with any size sprocket, either ⅝ or 1 inch pitch. Heavy knock-out axle, front hub to match.

Licensed Coaster Brake Manufacturers:

The Corbin Screw Corporation, New Britain, Conn.
The Corbin Screw Corporation of Chicago, Ill.
107-109 Lake Street

WAREHOUSES:
New York, 106-108-110 Lafayette St. **Philadelphia, Cor. 8th and Arch Sts.**

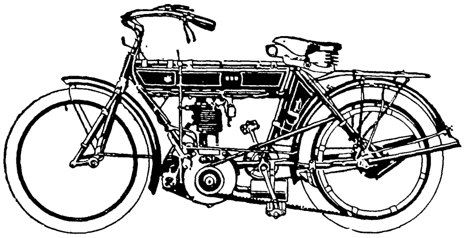


ARE
ON
THE
SQUARE

KOKOMO RUBBER COMPANY
KOKOMO INDIANA.

N. S. U. **MOTORCYCLES** **N. S. U.**

The Automobile on two wheels, built not only to sell, but to give thorough satisfaction under every condition. IN MANY SIZES AND TYPES.



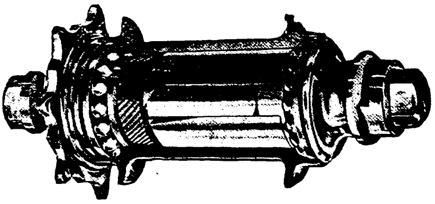
4 H. P. MODEL DE LUXE

Two speeds and free engines, Magneto ignition, handlebar control, M. O. Valves, etc., makes it the "WORLD'S BEST"

AGENTS: Write for catalog "A" and territory today.

N. S. U. MOTOR CO., 206 West 76th St., New York City

Year-After-Year Popularity *IS THE RESULT OF* **Year-After-Year Superiority**



The Eclipse Coaster Brake

was the first satisfactory brake on the market, and is today still the most satisfactory brake.

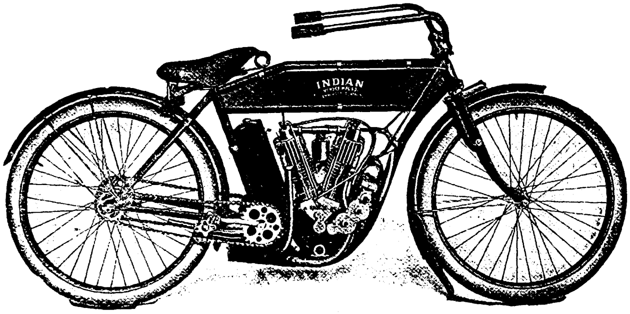
WHY EXPERIMENT?

Eclipse Machine Company, Elmira, New York

1089 MILES, 199 YARDS

WORLD'S 24-HOUR RECORD BY

THE INDIAN



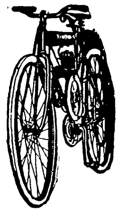
Done by one 5 h.-p. Stock Machine, by Charles S. Spencer, at Stadium, Springfield, October 1–2. And without a single repair or replacement on motor. At same time another **Indian** made 1043 miles—also breaking record.

AN UNEQUALLED PROOF OF QUALITY & POWER

Hendee Mfg. Co., Springfield, Mass.

CHICAGO BRANCH: 1251 Michigan Avenue

[**MEMBERS MOTORCYCLE MANUFACTURERS ASSOCIATION**



BARGAINS

If you have not sent your name in for our big accessory catalog you have missed a good thing and lost $ $.

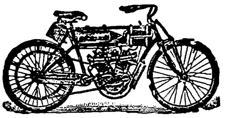
About half the riders in America buy parts from us because all are guaranteed and the prices are the lowest.

We have the largest accessory stock in America.

Send postal to-day for catalog A.

MOTORCYCLE EQUIPMENT CO.
Hammondsport, N. Y.

GEER MOTORCYCLES



5-H. P. 2-cylinder GREEN EGG	$225.00
4-H. P. BLUEBIRD - - -	200.00
2½-H. P. GEER Model 4	150.00
Used motor-cycles - - -	40.00

We have the largest line of new and used motorcycles in the country at the lowest prices. Every machine guaranteed. Repairs a specialty. Motors and castings for air-ships. Motors for railway velocipedes. Send for catalogue.

HARRY R. GEER CO.
856 McLaran Ave. St Louis, Mo.

"Wouldn't Take a *Thousand Dollars* For His Curtiss Motorcycle"

Altoona, Pa., May 28, 1909.

Herring-Curtiss Company,
Hammondsport, N. Y.

Gentlemen:

Machine arrived in fine condition. I have had three different makes in my time and must say that your machine for Power, Speed, Hill Climbing and Easy Starting can never be beaten. I am more than pleased with this little steed of steel, and would not take *One Thousand Dollars* for it to-day, if I couldn't get another one.

Thanking you for your prompt and courteous attention given my order, I am,

Yours very truly,
A. M. CONRAD.

This is but one of hundreds of similar unsolicited testimonials received from Curtiss riders.

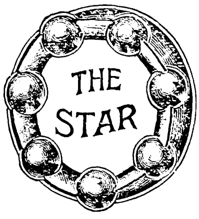
Every Curtiss motorcycle is just as good as this one.

Write for Agency Proposal to-day.

HERRING-CURTISS COMPANY
Hammondsport :: New York

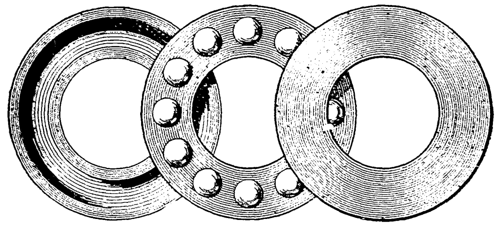
New York Distributor:
CURTISS MOTORCYCLE COMPANY
1203 Bedford Ave., Brooklyn, N. Y

Pacific Coast Distributor:
G. A. FAULKNER
351 12th Street Oakland, Cal.

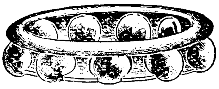


THE STAR BALL RETAINER CO.

Lancaster, Pa., U.S.A.



Complete Thrust Bearing



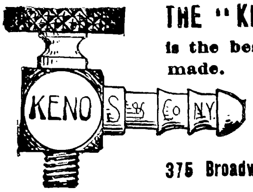
Radial Retainers

Manufacturers of Radial Ball Retainers, Thrust Ball Retainers, Complete Thrust Bearings, Special Stamping, etc.

Torpedo Motorcycles

WHY HESITATE? Unless you ride the BEST you cannot be a SATISFIED MOTORCYCLIST. You know there can be but one BEST and that is the TORPEDO. Write for catalog and agent's terms.

The Hornecker Motor Mfg. Company
Geneseo, Ill., U. S. A.



THE "KENO CONNECTION"

is the best pump nipple ever made. One sample for 15c.

Stevens & Co.
375 Broadway, New York City, N. Y.

Motorcycle Accessories

Send for largest and most complete catalogue ever issued. **Indian & Harley-Davidson Motorcycles, $50 Up.**

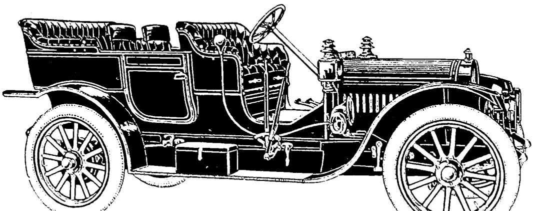
F. B. Widmayer Company, 2312 Broadway New York City

SPROCKETS

for Bicycle and Motorcycle

WE MAKE 90 PER CENT OF THE SPROCKETS USED

THE PARISH & BINGHAM CO.
Cleveland, Ohio



MODEL 46—$2500

The six cylinder car is the highest type of four cycle manufacture.

It is a vain attempt to minimize the inherent evils of the four cycle engine; which can only be escaped in the valveless two cycle Elmore.

It comes closer to the chief virtues of the Elmore valveless two cycle engine than any other.

It *tries* to give you continuous power—but what an appalling price you pay in complication and expense, without attaining the desired result!

In the 1910 Elmore catalogue, about to be issued, is an illustration which will make every four cycle owner stop and think.

It shows the Elmore engine in all its simplicity.

In contradistinction, it likewise shows the mass of trouble-making parts required to produce inferior results in the four cylinder engine.

In the Elmore four cylinder car—no valves, cams, springs, lifts or rollers. In the best six cylinder four cycle car—something like 150 parts, all adding their little quota to the cost of repair and upkeep.

In the valveless Elmore—absolute certainty and peace of mind—not a trouble to vex the owner from year to year; not a part to replace or repair.

In the other—the same uncertainty in principle and in operation, whether the cylinders be two, four or six; whether the price be high or low; the workmanship superfine or inferior.

Every Elmore dealer stands ready to prove to you that the 1910 Elmore represents:—The valveless two cycle engine brought to a state of perfection that stamps the best four cycle engine a mechanical makeshift.

The simplest engine in the world beyond peradventure — the simplest, and by natural sequence, the smoothest and the most inexpensive.

Mark this prediction: — Investigate by demonstration the two new 1910 Elmore models and you will be forced by sheer weight of evidence to select one or the other in preference to any four cycle car made.

Elmore

Model 46, 1910 Elmore, $2,500
(4 cylinders 46 H. P., 60 miles an hour)
Model 36, 1910 Elmore, $1,750
(4 cylinders, 36 H. P., 50 miles an hour)

THE ELMORE MFG. CO., 904 Amanda St., Clyde, Ohio
Member Association of Licensed Automobile Manufacturers

MECHANICAL AND TECHNICAL DEPARTMENT

EDITORS

Gasoline vehicles—Chas. E. Duryea, Reading, Pa., Consulting Engineer, A. M. C M. A.
Steam vehicles—J. A. Kingman, Locomobile Co. of America, Bridgeport, Conn
Two Cycle Engines—Hugh Dolnar.

REGULATIONS OF THIS DEPARTMENT

We are pleased at all times to answer the questions of our readers and also grant full use of these columns to those who disagree with what is expressed herein, but we insist upon the following simple rules being adhered to.

1. Plain writing, on one side of the paper only. Typewriting preferred.
2. Letters should be addressed to the Editor for whom they are intended, care Cycle & Automobile Trade Journal.
3. Questions will not be answered unless bearing sender's name and address. These, however, will not be published if so requested.
4. Questions should be clearly stated, without tedious preamble and should reach Philadelphia by the 5th of the month to be answered in the following issue.
5. Answers not for publication should not be expected by mail without remuneration.
6. For Motorcycle Answers see Motorcycle Department.

HOW MANY CLYINDERS?

[502.] I am in the market for a runabout and of course want a machine that will cost the least for upkeep. and I am of the opinion that this can be best found in the single cylinder car, but as there are so few of them made, I would like you to point out if possible the advantages of the single, twin cylinder and four-cylinder cars over each other, with the exception of speed. The most important feature that I am after is what advantage has a two and four-cylinder over a one-cylinder (barring speed) and also more or less what is the difference in cost of upkeep.

As I expect to get a machine just as soon as I decide on what I want, I expect to go down on your list as a subscriber in the near future to your Journal. I have looked over several lately and find them very instructive indeed.

LAREDO, TEX. B. D. C.

We cannot in these columns specify any preferences for particular makes. This would not be just to the advertiser that we might not prefer, and anyway my preferences would not prove that some other rig would not suit you better. I believe that the time is coming when buyers generally will give more careful consideration to the construction and weight of the rigs and less to the size and shape of the body or the finish and trimmings. The average man has not been a mechanic and so has had very little opinion about the mechanism, but his wife is an expert on color and comfort. Your letter is along the right line, but the difference between the mere number of cylinders is far from being the whole thing to look at. A single cylinder engine must have a heavy fly wheel and for a given power it must be very large and deliver some disagreeable impulses. Two cylinders will deliver the same power with about one-quarter the strain on the parts and one-quarter the vibration due to the fact that the impulses are but half so strong and come twice as often. Three cylinders cut the vibration and strains to one-ninth and permit reducing the fly wheel very largely. Four cylinders would give but one-sixteenth the vibration, still less fly wheel, etc. These figures do not represent the full facts for other factors enter. Many think the four is enough better than the two to pay to choose it. Most buyers buy fours on the principle that if two is good four is better.—C. E. D.

PROBABLY THE SPARK

[504.] Being a subscriber of your valuable journal, I would like to ask you a question. I have a new Mitchell runabout, 4-cylinder, 20 H. P., bought in June, it has given satisfaction up until now. When the car is not working hard it will run fine and not make a skip, but just as soon as I come to a hill it will begin to skip and keep skipping until the motor will stall even on low gear. Wiring is all good. Batteries good, test 25 amp., plugs in good shape, coil is all O. K. Thought it might be due to water in carburetor, cleaned it all out and found none. Cannot understand what is the reason.

WEST FARMINGTON, O. CARL F. HART.

Your trouble is certainly peculiar. The only thing I can imagine wrong is that the coil has been broken down or the points of the plugs are too far apart. It will jump perfectly when there is but little compression but when taking hard work and using full charges it gets a compression too high for the spark to pierce. The jump spark takes the line of least resistance and will leak in the coil or follow the soot of the plug when it is needed most and yet jump at the points of the plug in fine shape when tested or when there is but little compression. Take the wire off the plug when the engine is working as hard as it will and see how far the spark will jump. It should jump about three-eighths of an inch. If it does not it probably snuffs out under compression. You can test without taking off the wire if you hold a Leyden jar discharger near the plug nut and rest the other point on the engine. The spark will jump a big gap to the discharger rather than the small gap between the plug points. If you can relieve the compression a little by opening a relief cock a little you can get an idea as to whether this is the cause or not.—C. E. D.

COIL AND PUMP TROUBLES

[507.] Some weeks ago I decided to write asking for information regarding trouble I had with the 1909 car, but waited to take one more round out of it before writing you. The trouble has now been found, but thinking it might interest others will give the trouble and remedy.

A four cylinder 1909 car, 4½-in. cylinders, exhausted very irregularly, especially on a grade. Some exhausts were very much louder than others and occurred at irregular intervals.

When four or five occurred very close together it acted somewhat like a brake. It was different from a misfire, seeming rather that more gas passed through the cylinder than was digested for the motor, apparently exhausted evenly except for the difference in volume of sound.

Tried different wiring, new plugs, new carburetor, and even a separate return wire from each plug, but still could not locate the trouble.

The remedy—happening to press down flat spring in one of the coil units, I noticed a sound somewhat resembling that caused by pressing the bottom of an oil dripper. This sound did not occur every time the spring was pressed down. One new coil unit was substituted and the trouble was remedied, the fault seeming to be in the spring.

Last year I ran a four-cylinder 4¼-in. air cooled car and desire to state that when changing to a this year's water cooled model I have had more trouble with the water circulation than the whole air cooled car gave in the time I ran it. The water cooled motor has been a great deal hotter than I have known the air cooled to be.

The present trouble is the small steel plate driving pump getting bent or broken. I am told it is in the circulation, again that it is in the gears of the pump catching, but it seems from the water used which has averaged 1¾ quarts per hundred miles for the last six weeks that the pump pushes water to the top of the radiator and through the overflow faster than the water is drawn from the bottom of the radiator to the pump. The motor is now doing 18 miles to a gallon of gasoline and the supply is down close to popping in carburetor.

Could you tell me where to look for the trouble with the pump? Pump bearings are not grooved. If casting is substituted for steel piece the fastening pins are sheared off. Water seems to run through radiator when being flushed out with hose.

PLAINVILLE, CONN. F. T. P.

Your experience is interesting, but it is not clear how the faulty vibrator spring could have caused the trouble. Probably it was slow in action and so allowed the charges less time to burn with the result that they exhausted under greater pressure.

Your water cooled engine experience is valuable. I have used and seen used the two cars you mention and knowing them to be alike everywhere except as to the cooling became absolutely sure of the superiority of the air cooling. My experience during the last two years with air cooled 2-cycle engines confirms the value of the method. It would seem that you are attempting to drive the pump too fast for the size of the pipes. Water is not compressible and if it cannot get out of the way offers a very high resistance. Often in fitting the hose in place the inner lining will be turned back and practically stop the hose. Some obstruction is probably the cause of your trouble.—C. E. D.

FAULTY LUBRICATION

[510.] My 1908 runabout has lately got so that I cannot keep the motor lubricated. Starting out with oil at the proper level in the crank case and feeding correctly from the exhaust pressure oiler, it at once goes to smoking and after less than 20 miles' running the oil will be nearly all out of the crank case and the motor pounding on the grades or heavy roads. The oil seems to go by the pistons and burn up. Have tried light and heavy oils and put in all new piston rings and have excellent compression. The burning oil naturally makes a good deal of carbon which causes the knocking, but why should the oil escape and burn in that way? It does it just the same immediately after the cylinders and piston heads have been cleaned.

I noticed that you often recommend mixing cylinder oil with the gasoline, but I cannot just now see where you have given the proportions. Will you kindly say how much oil to the gallon of gasoline, and will the oil not sink to the bottom of the tank? Will it require different adjustment of the carburetor? Would you recommend it in this case?

I think the trouble may be in insufficient water circulation, although it seems to circulate well enough. What can I do to remove possible scale or sediment from the water jackets and radiator?

GRENOBLE, PA. N. E. ARNOLD.

Better write the makers. They should be able to advise you about the queer behavior better than one who is not personally acquainted with your car. Since the rings are good it must be that your oil is not or your cooling has gone wrong. You have changed oils and probably have gotten good oil some of the time. If your radiator gets warm it shows that the water is circulating. But if it steams at the top and stays cold for quite awhile at the bottom it means that the engine fills with steam, and that the water is unable to circulate for some reason. Faulty oil will cause just such trouble. It burns on the cylinder walls and smokes away. This leaves the walls dry and they get hot from friction and the engine will pound badly, but this would not explain the presence of oil in the firing chamber. If your spark system is at fault it may miss fire part of the time. No pressure in the firing chamber allows the oil to come in freely and when it fires again it will make a lot of smoke. So examine the ignition parts. Oil in fuel is recommended for 2-cycle engines. It is not so well fitted for 4-cycle ones. In your case try ½ pint to 1 pint in 5 gallons of gasoline. No change of carburetor necessary. But be sure the oil is of high fire test or it will vaporize and make the mixture too rich.—C. E. D.

HIGH VS. LOW COMPRESSION

[520.] I would like you to answer a few questions for me in the next issue of the Journal.

I have been advised by an expert (?) that high compression in a four-cycle motor is advisable for the reason that more power can be obtained at slow engine speed; that the motor will pull better and that less fuel is consumed. But I note in the October Journal, you advise an inquirer that low or, rather, medium compression is better. I would be glad if you will explain the good and also the bad points of each.

When some cars are stopped suddenly by an emergency application of the brakes I have noticed that one rear wheel slides while the other will slowly turn backwards. Now is this due to the differential gears?

I am thinking of placing an ordinary oil cup just over the intake valve of my motorcycle motor, this cup to be of the sight feed variety, but filled with gasoline and regulated for a very slow drip. My idea is to open the feed of this cup when I reach the ascent of a steep hill. Will a few drops of gasoline fed right on top of the intake (automatic) valve help the motor any in a place like this? The valve cover, or dome, is held in place by a half-inch pet cock, which can readily be replaced by the oiler. I might say that this motor is of the Indian variety, so as to give you an insight into what I am working on.

MEMPHIS, TENN. GEORGE D. TUCKER.

A high compression engine runs badly at slow speeds. The high compression requires a heavy fly wheel to force the piston over it. If there is any leak at all (and few engines are tight), the high compression causes the charge to leak out, at slow speeds and so there is little left to give any power when it does fire. If the valves, rings, etc., are perfect this does not occur, but it is one of the likely things to be considered. The explosion following a high compression gives a high pressure and this requires strong construction. The impulse or working stroke is a blow rather than a push. With the low compression the large compression chamber acts as a cushion and the engine works more sweetly and more nearly like a steam engine. For speed only use high compression and high speeds, but for daily use the low compression. It makes a much more flexible and sweet running rig.

If the emergency brake holds the balance gear, it cannot turn. Either the rear wheels must both stop or if one turns the other will turn in the reverse direction. What happened in your case was that one wheel was on slippery ground and the turning backward of the other forced the first to turn forward. (I use these words with respect to their motion at the contact points.)

If your cylinder does not get a mixture fat enough for full power it will help some to feed some additional fuel. But if it already has a proper mixture more will simply clog it and reduce the power. The reason for this is in the fact that fuel completely burned will develop 3 to 5 times the heat that it will develop if only partly burned. When too much fuel is present the burning is but partly performed and little heat results. Proper burning forms carbon dioxide with much heat whereas an excess of fuel forms C O with little heat.—C. E. D.

TWO-CYCLE BEST AT LOW SPEEDS

[523] Taking advantage of the kindness of your magazine in answering its subscribers' questions, will you kindly enlighten me on the following?

How is the H. P. figured on a 4-cylinder, 4-cycle auto engine? Estimating a 4-cylinder engine, cylinder 4x4½, about 30 H. P., giving two explosions to one revolution of the shaft, why is the H. P. so much greater than a single cylinder 2-cycle, same size cylinder, giving one explosion to each revolution?

BOSTON, MASS. WALTER P. HEWINS.

The H. P. of an engine is estimated from the piston displacement. It is commonly assumed that pistons should not travel faster than 1000 feet per minute, so the stroke is often ignored and the power estimated from the bore of the engine. Square the bore in inches and divide by 2.5 for the power of one cylinder. From this you will see that your engine is rated rather above the formula. I do not say it will not give the rated power, but most engines fall under it rather than above it. There is a wide difference in the maximum performance of an engine due to many things. If the valves are tight and the mixture good, the power may be had, but the very next day the carburetor may be different and the power fail. It is therefore more important that an engine should be good at low speeds than that it should be capable of spectacular maximum work. The usual two-cycle engine has been developed for boat work and has not been worked up to a maximum. A good two-cycle can give from 1.5 to 1.7 the power that a four-cycle gives from the same size bore and stroke. But because they have not been worked up to the maximum powers possible, buyers are often disappointed in them. Further, a two-cycle should be designed for the speeds it works at most of the time and let the maximum take care of itself. The ports cannot be adjusted as can the valves of the four-cycle, and if made for maximum performance they may not be right for best work at the most common speeds. Many a user will tell you that a two-cycle is a puller par excellence as it is slowed down. This is a desirable feature and much to be preferred to maximum power at high speed.—C. E. D.

INFORMATION ON VALVE TIMING

[525] I wish you would give me what information you can in the columns of your paper in regard to the setting of valves in a four-cycle automobile engine. My engine is a four-cylinder, 4¾ inch x 4¾ inch air cooled; compression is about 45 to 50 pounds. The size of valves is 2⅛ inches mechanically operated. The valves are timed exactly as recommended by the manufacturer. The exhaust valve opens 30 degrees before center; closes 2 or 3 degrees past center. Inlet valve opens 5 to 10 degrees after center and closes 30 degrees after center. The engine does not overheat.

It seems to be very strong and smooth at speeds from 1200 revolutions up. It does not pull as well as I think it ought at slow speeds, i. e., 200 to perhaps 800 revolutions.

Would the timing of the valves of two engines which were exactly alike except for the size of the valves, be the same? Do you believe that the valves in an engine in closing follow the exact shape of the cams at speeds from 1200 to 2000 revolutions?

AUBURN, ME. A. H. S.

I think your inlet closes too late for best results at slow speeds. Try lessening the lift of the inlet so as to make it open a little later and close a little earlier. The late opening will not hurt anything at slow speeds and the earlier closing will help. If the inlets are operated by a separate shaft you can set this ahead one tooth and make the inlet open earlier as well as close earlier.

I would go after the carburetor. I fear you do not get a proper mixture at slow speeds. An engine that will run smooth at one speed cannot be far out at another. But a carburetor that will make a spray when a large amount of air is pulled through it may only deliver drops when the air supply is slower. Also look to your compressions. An engine that will run well at high speeds because the gases do not have time to leak out may give all sorts of trouble at low speeds because there are no gases left to fire or work because they have leaked out.

In general the timing of two engines should be alike. If the valves are smaller they should lift a little higher and remain open slightly longer. Whether a valve follows the shape of the cam or not depends on the strength of the spring and the shape of the cam. Many cams are so abrupt that the valves are thrown at speed and do not follow. The weight of the valve has much to do with it. I believe in light valves. The use of shear springs instead of helical ones leaves out a lot of spring weight and by using light nuts and such fittings the valve weight to be lifted can be reduced very materially in most cases.—C. E. D.

CONNECTING RODS BROKE

[526.] I bought a second-hand car last winter and since then have had some queer experiences, except that of driving the car. When I was told that the car did not need any overhauling I believed that to be true because the owner, a man of prominence, told me so.

So when spring came I started out to run the car, but the attempt was a failure.

I then, after expert advice, took out the transmission, repaired the gears, put new bearings in, etc., and started out again. I had gone a short distance at slow speed and attempted to change to high when the engine at high speed broke a piston rod and smashed the crank case. I repaired the damage, had a new piston rod made and started out to try it again. And the same thing happened again. And that is where I am now.

I want to ask you as experts what the cause can be, whether you ever heard of any other case like this. Could I in trying to change speeds with the clutch relieved, lock the gears in some way as to break the motor? Or do you think that the high speed of the engine alone is responsible for the breaking? The car had been run for some distance on all speeds, so that everything appeared to work well. My engine is an opposed motor of 10 H. P. Would you advise drop forged instead of bronze connecting rods? I notice how helpful the Journal is to car owners, so perhaps you can advise me what to do in this matter.

MUSKEGON, MICH. J. B. BENSON.

It is impossible to say what is the trouble without seeing the job. My brother ten years or more ago said that 99 per cent. of all auto troubles were due to high speed. The fact that you broke the rods while changing the gear would indicate that you allowed the engine to race. Of course the rods may have been worn quite thin and so have broken more easily than they should. In changing gears the engine should be kept running slowly. But the green hand cannot think of all the things at once and taking off the load lets the engine speed up. Meshing the gears would not give much of a shock because the gears are not heavy and speed up quickly. If your clutch is severe the transmission could get a bad jerk when the clutch is let in quickly with the engine running fast, but this would jerk the vehicle and the fly wheel weight would protect the engine from damage. The racing of the engine seems to be the most likely cause.

Steel rods, whether cast or forged, would be more likely to stand up than bronze, although some bronzes are strong as steel. But when exposed to heat brass or bronze may get brittle and break easily. Some alloys seem to change their construction and lose strength. Brass in particular is likely to do this; more especially if thin in section so the air and moisture can get at it.—C. E. D.

BETTER USE METAL

[527.] I have a four-cylinder car of well known make which runs very well with the exception that the timing gears are very noisy and clatter all the time.

In the early summer the car was fitted with new gears as follows: Bronze on main shaft, steel cam, fiber idler and bronze pump and magneto. These ran very well until about a month ago when the fiber gear swelled and stripped. The engine was then fitted new all around as follows: Bronze main shaft, steel cam, steel idler and bronze pump and magneto. These gears did not fit perfectly when new, there seemed to be considerable play between all of them; within a short time after their installation they became noisy and are getting worse, although I have kept them well oiled.

I would like your opinion as to the best gears to put in when I replace these, and what the general practice is among the oldest and most experienced builders.

Which will wear the longest and which will run the quietest, all steel, steel and bronze, or a fiber combination, in other words, of what material would you make each gear to have them quiet and durable? Has the fiber gear been perfected so that it is perfectly safe and reliable? In this engine the crank shaft gear works the cam and idler and the idler works the pump and magneto.

PORT JERVIS, N. Y. F. T.

Your trouble is that the gears did not fit in the first place and wearing does not improve them. Carefully cut gears set with pitch lines corresponding run with little noise. There is very little to be gained by the use of bronze. It does not wear so well as steel and is hard enough to be noisy. The use of fiber is good so far as preventing noise is concerned, but fiber gears are of course, not as strong. Rawhide is also used and where it is not exposed to heat it is all right. It wears well, but if exposed to moisture will swell some. The common practice seems to be to use metal and encase them so as to insure copious oiling and hold the noise. You had better use all metal if the job was originally so equipped, for the widths allowed by the maker may not be sufficient for the lesser strength of the fiber.—C. E. D.

HOW TO CASE HARDEN

[531.] Is it possible and practical to go a depth of 1-64 inch of case hardening in 12 to 15 point O. H. steel in two hours from the time of entering the furnace until it is out again? Test piece 6 inches long, three-quarter diameter. Bone or similar case hardening material to be used. Is it a possibility by any other process?

CLEVELAND, O. E. P. HEDGES.

Without having tried it, I would say "Yes." The chemical change can take place very quickly if the heat and carbon are present. I gather from the test piece size that the pieces are small. They will therefore heat up quickly, unless they are packed in very large pots. The sure way is to let your hardener try several pieces and break them and see for yourself just what is the result. The temperature of the furnace, the size of the pot or cold body to be heated, the quality of the carbonizing material, and the quality of the steel all enter into this problem. The cyanide process is very quick and by boiling the metal in the melted cyanide can be sent in the depth you require very easily. Its expense is against it and this is against the bone process. I would think it cheaper to use more time and a less active material.—C. E. D.

TIRES KNOWN AS SECONDS

[532.] I am a subscriber to your Journal and write for some information.

What is the difference in the regular tires and the seconds? I received circular quoting price of $16.00 on 30x3½ casings seconds. Do you think it would be economy to buy seconds at this price when the regular tire would cost about $30.00?

GROVESBECK, TEX. D. N. RANKIN.

Usually things are worth what they bring. If seconds can be bought for the price you mention that is about what their real value is. A second is a tire that has been made up just as a first, but some fault or defect prevents it being sold as a first. It may be badly cured. It may have a wrinkle or blister that prevents its being sold for first class. The pressure supposed to be in it may have been lost and it may have been vulcanized without filling the mold. Other causes for throwing it out may exist. Some of these causes may hurt it, others not. It may wear just as well as a first. Or if there is a bad wrinkle in it the tire may break in a few miles and let the tube burst. As a rule the best value lies in medium priced goods. If your car is easy on tires you will be wise to take the risk, but if heavy or overpowered better not. You understand of course that seconds are not guaranteed. But the light rig seldom wears out a tire in time to take advantage of any guarantee anyhow.—C. E. D.

RECHARGING A PERMANENT MAGNET

[535.] Will you kindly give me the information asked for below?

I have a magneto having two magnets which I wish to recharge. I wish to recharge them to saturation. A 100 volt direct current is available. How many turns of what size wire shall I wind on each leg of magnet? What should be direction of winding? How many 16 candle power lamps shall I place in series with the coils?

NORTHPORT, N. Y. R. O. BOGART.

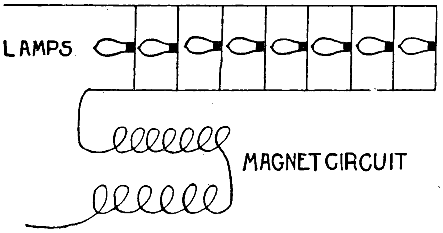


Diagram of method of recharging a permanent magnet.

The charging of magnets requires some care. If the coils are simply wound around the magnet as you describe and the current turned on and off the discharge of the coil will likely discharge the magnet. Further the magnet should have a keeper and this should be kept in place. In other words, the magnet should be in its place with the armature in and the magnetism should be put into it by an electro magnet which can be placed in close contact and removed without turning off the current or else there should be a rheostat provided by which the current can be gradually reduced so as not to discharge the magnets. The amount of current depends on the application a little. If the wire is directly wound on the magnet you get no loss and less is required than if the separate magnet method is used.

The amount of current depends on the resistance of the magnet to be charged. If it has a keeper closely fitted so the magnetic lines of force can flow easily it can be charged much easier than if it has air gaps to force the magnetic lines through. Electricians have adopted expressions which mean very little to us folks who do not go into the theory very deeply, but possibly I can make clear to you how to go about it. Steel is assumed to be saturated to its full retaining capacity if 100,000 lines of force are sent through each square inch of area. Your magnet has about three-quarters square inch area of cross section and about 12-in. length. There will be some leakage and some extra turns of wire must be provided to overcome this. If you wind the magnet as proposed, probably 25 ampere turns will suffice per inch of length or a total of 300 A. T.

The ordinary 16 c. p. lamp lets about half an ampere flow through it. So if you use but one lamp you will require 600 turns of wire total. But if you put another lamp in the circuit by the side of the first (not in series with the first lamp) you will get a full ampere of current and require but 300 turns of wire. Four lamps will require but 150 turns and eight lamps but 75 turns of wire. An ordinary 16 or 18 wire will carry many amperes of current, so you will not need many turns if you use lamps enough. It is usually easier to use more turns of wire and fewer lamps.—C. E. D.

Mr. Accessory Dealer!

We Are Talking Right to You

¶ If successful business means selling goods and making CONTENTED CUSTOMERS at the same time, you owe it to yourself and your trade to know

THE RONSON WRENCH

RONSON WRENCH
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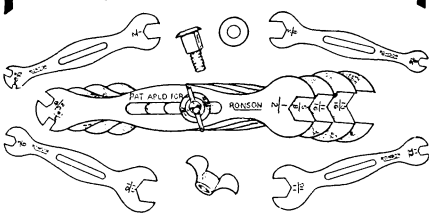
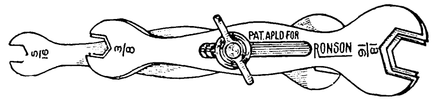


"NINE IN ONE"



Foreign and American Patents Pending

¶ Since our first ad. appeared in the October issue, we have been overwhelmed with inquiries from all over the country.

¶ We asked those owners who could not get the RONSON Wrench from their dealers to remit direct.

They Did, in Plenty

¶ This trade belongs to **you**, and we want you to have it. Do we need to enlarge on the selling power of the **RONSON Wrench**; on its absolute novelty, practical utility, and its unparalleled handiness to every man who has a car, motorboat or motorcycle?

¶ Made of the very best material money can buy, beautifully finished in nickel, so designed and thought out as to handle nearly every nut on the car—compact, light, separable into

Nine Perfect Thin and Strong Wrenches

of wonderful convenience in its combination, and really cheap notwithstanding,—don't you think ?

It Is a Real GOOD Seller

¶ We have a sizable retail department ourselves. We sell 99% of those who see this tool in a flash.

So, We Know!!

¶ We help our trade to sell, too. We supply them with handsome Display Cards, with the Wrench embossed full size, in white on a black background, and furnish attractive printed matter and cuts.

¶ Don't think we are not sincere because this is only "advertising." We mean every word we say. We have no other means of reaching you.

¶ Turn down the corner of this page and write us NOW for prices, terms and proposition. The time spent will reap golden harvest in **Contented Customers.**

CRYDER & COMPANY, Park Ave. & 63d Sts., New York City, Sole Agents

FILLING ACETYLENE TANK

[537.] Will you kindly let me know what is the process used in charging Prest-O-Lite tanks or tanks of this character? I understand that they charge these tanks with acetylene gas up to about two hundred and fifty pounds. Why is it that they use copper tanks when all the generator people make their generators out of brass? Is the mixing of the water and carbide harder on copper than on brass or do the tank people simply use the copper on account of the strength? Are these gas tanks lined with tin or lead or anything of this kind? I have been told that they have a sort of a mineral wool or something of this kind inside. Why should they need anything in these tanks? How much water should be used to completely consume a pound of carbide?

What I am trying to get at is the tank people are charging $2.50 to charge these tanks with gas supposed to be under a pressure of about two hundred and fifty pounds. What I am after is to try and get at about how much carbide is used to charge these tanks to that pressure. Making a wild sort of a guess, I figure that about three pounds of carbide should charge one of these tanks and unless there are other expenses, which I know nothing about, it looks to me as though the tank people are charging an outside price, when you consider the big first charges they make for these tanks.

CINCINNATI, O. R. B. GOODRICH.

I do not know about the construction of the tanks. Acetylene will under some conditions combine with copper and make a scale which is a sort of fulminate and will often explode when bent or crushed. Further acetylene seems to be more explosive when under pressure so it is dangerous stuff to handle. On this account it is not to be fooled with by inexperienced people. The tanks are filled first with some absorbent material like asbestos. A variety of absorbents are used. This is then saturated with acetone. Acetone has the peculiar property of condensing the acetylene or in some way enabling it to be put into a much smaller space than it can otherwise be put. Then the acetylene is forced in. If the absorbent does not fully fill the tank and remain in place the acetylene may separate from the absorbent and when separate, is dangerous. A pressure above two atmospheres is dangerous unless protected by the absorbent. There are some patents on these tanks I believe and this probably explains the seemingly high charges. A pound of carbide makes about five feet of gas at atmospheric pressure. Full particulars on the subject can be had in a $2 book by Leeds & Butterfield.—C. E. D.

(In the November, 1907, issue, page 214, was published a description of the arrangements and method of filling such tanks.—Ed.)

SOME STATISTICS

[456.] Will you kindly answer the following questions through the Journal:

Give number and value of pleasure cars produced in the United States in the years 1905, 1906, 1907, 1908, and 1909; same for commercial cars. How many cars have been built in this country having friction drive? How many having two-cycle engines? Is there any American manufacturer willing to sell his commercial cars on a positive guarantee that the total operating expenses will not exceed a fixed sum per month over a term of years? Kindly give the names of several bus lines or public service express lines doing business on a large scale, with commercial vehicles. Also, please give the production (number of cars and values) in France, England, Germany, Italy and Belgium for the years 1907, 1908 and 1909. How many taxicabs are operating in London, Paris, Berlin, Vienna, St. Petersburg, New York, Chicago, Boston and San Francisco. Kindly furnish list of a dozen or more names of places where sight seeing buses are in use. The above information will be greatly appreciated.

PITTSBURG, PA. W. W. MACFARREN.

There is no record kept in this country of the automobile production and so any figures on this subject must be guesswork. It is believed that there were 80,000 autos sold in the United States this year. The average value is about $1,800 each, I think. Some folks estimate a total of 200,000 in use in the United States, but this would seem to be far below the full number. Most of the early rigs are in use somewhere. Probably 3,000 friction drive cars have been built, which does not include the little Orient Buckboards. One concern claims to have made about 4,000 cars with 2-cycle engines, so there are probably 5,000 of this kind all told. There are concerns who contract to maintain their cars in condition to operate, but they probably take only such contracts where they have facilities for repairing and looking after the rigs.

A fairly reliable estimate of the value of autos of all kinds made in the United States runs as follows: 1903, $16,000,000; 1904, $25,000,000; 1905, $42,000,000; 1906, $59,000,000; 1907, $106,000,000; 1908, $100,000,000.

It is estimated that France porduced 6,000 cars this year and Germany slightly less. Italy and Belgium, of course, produced but a small number each.

Most any city of importance has bus and hack lines using power vehicles. It is not possible to get at the exact figures unless under government control as in France. There the proportion of business vehicles to pleasure cars is as 3 is to 4½. London and New York have each several thousand taxicabs. Paris has many. St. Petersburg has but few, but is ordering more. Chicago has several hundred. Sight seeing buses can be seen in most of our larger cities, and they are to be found in most of the county fairs, where they do a good business, giving the people a short ride for a small fee.—C. E. D.

2-Cycle Engines

HUGH DOLNAR.

Questions will not be answered in this department unless the inquirer gives his name and address. The name and address will not be published if so requested. Put name and address on all drawings. When possible fold drawings and mail in envelope with the description.

DOUBLE ACTING TWO-CYCLE

[485.] I have invented a 2-cycle double acting gasoline engine, or what I would call a 1-cycle, as the gas acts on both sides of the piston, and for auto use this engine could be started without cranking, would run backwards and would have very little vibration. I have applied for a patent on same, and before I have a model made, I will appreciate it very much if you will kindly advise me whether or not you think that this kind of engine would be a practical one for auto work, also if it could be kept cool by using plenty of water on cylinder and in piston and if the speed would be too rapid for an engine of this kind. The only bad features that I can see is the trouble of keeping the cylinder and piston cool, also packings.

ODESSA, TEXAS. G. B. HAMILTON.

What you call one-cycle is more properly speaking double acting two-cycle engine. This type of engine is not new and has been tried out in various forms before. There is no advantage for automobile work in having an engine that will reverse as the engine must stop and start again and speed up to a point where it has power before the vehicle could be moved, while with a reverse gear the reversing can be done as soon as desired with the engine still running at speed and developing power. The disadvantage of having to keep the piston cool is very great and so complicates the design that it much more than offsets the advantage of having a double acting engine.

Packing of any kind as you say also causes considerable inconvenience and we would advise you to look into this matter thoroughly before putting any money into it.—ED.

TWO-CYCLE KEROSENE INJECTION MOTOR PRACTICABLE

[513] I would be glad to have you answer the following questions for me in your columns:

(1) What are the objections, if any, to the two-diameter piston type of 2-cycle car motor?

(2) Do you think that a refined and perfected 2-cycle motor of this type would prove superior to the crank-box pressure type of 2-cycle motor? It seems to me that a 2-diameter piston 2-cycle motor would eliminate the objections to the ordinary 2-cycle motor: short connecting rods, leakage at crank journals and insufficient charge at high speeds.

(3) In a 2-cycle motor, is it possible to eliminate the wearing down of the piston rings by the exhaust ports? If so, please explain how it might be done.

(4) What, if any, are your objections to using a kerosene oil carburetor with a two-cycle motor?

(5) Would it be practical to use kerosene fuel injection with a 2-cycle motor? What would be the objections to such a system?

(6) Do you think it possible that in the future the perfected 2-cycle motor will displace the 4-cycle motor as a motive power for automobiles?

(7) Do you not think that the future 2-cycle motor will be of some better and more efficient type than the crank-box pressure type?

GOODNOE HILLS, WASH. CHARLES PIGGOTT.

(1) Two-diameter piston makes a costly motor with a tall cylinder. The cylinder bore is long and the piston is heavy. Air valves must be used, and it is much better to use a separate air cylinder, making a shorter, more compact and cheaper motor.

(2) I would not use a 2-diameter piston, but a 2-diameter piston motor can be made so as to be far superior to any crank-box pressure cylinder supply motor. I have never yet seen a well designed 2-diameter piston motor working.

(3) Yes, by the ordinary steam engine piston packing two rings over a third ring as wide as both the two outer rings, all three rings placed in one groove, each ring cut once through 45 degrees angle cut and rings placed so as to stagger the cuts. Snap rings are bad and should never be used in a small gas engine, though they are common practice.

(4) No carburetor is needed for kerosene burning. Inject the fluid kerosene or let it run into the cylinder with the pure air charge as is common practice. See Secor kerosene motor.

(5) Yes; none.

(6) The 2-cycle will surely displace the 4-cycle motor for all purposes.

(7) Yes, I believe the final motor will be 2-cycle, air-cooled, separate air cylinder, pure air charge, injected fuel, either liquid or finely powdered dry fuel.—H. D.

TWO-CYCLE H. P.?

[515] What speed and what power should I get from a three-cylinder 2-cycle engine of the following dimensions: Bore 5 inches, stroke 4 inches, intake to cylinder 7-16x4-inch clear opening; exhaust ⅞x4-in. clear opening; compression 72 lbs. gauge; deflector as shown in sketch. Intake to base through horizontal check valves 2⅜-inch diameter clear opening. Valve leather faced and light springs; single carburetor and manifold; 1½-inch copper tubing. No discs on crankshaft. Engine well made in every way.

BOSTON, MASS. W. H.

For full reply see page 109, this publication, October 1, 1909.—H. D.

WHY SO FEW TWO-CYCLE MOTORS ARE USED IN AUTOMOBILES

[521] Will you kindly tell me, either direct or through your inquiry column, why the four-cycle engine has been so generally used in automobiles, to the exclusion of the simpler two-cycle engine?

What are the objections to the two-cycle engine?

I make these inquiries because I am asked to interest myself in the manufacture of a car having a two-cycle engine.

CLEVELAND, O. V. M. MOORE.

The 4-cycle motor has four piston strokes in its circle of functions. The working stroke, during which the charge is burned generating pressure which forces the piston downward in a vertical motor, common form, the exhaust stroke, in which the piston is driven upward by power from the crankshaft, the intake stroke in which the piston is pulled downward by power from the crankshaft and sucks in a fresh combustible charge, and, fourth, the compression stroke, in which the piston is forced upward by power from the crankshaft and compresses the charge ready for firing. The working stroke only has a pushing and turning effect on the crankshaft, so that each cylinder and piston is working only one-quarter of the running time, and the piston must be driven by the crankshaft during three-fourths of the running time, but each function of the cylinder and piston has a stroke of its own, with an intake and an exhaust valve and a camshaft and cams and valve springs to open and close the valves at the right times. All of this makes the 4-cycle motor certain in action, the four functions of charge burning and power generation, of clearing the cylinder of combustion products, of drawing in a fresh charge and, finally, fourth, of compressing the charge ready for lighting and burning during the working stroke which drives the crankshaft, being separated and certain of proper execution. It is this certainty of function performance which gives the 4-cycle motor the preference.

The 2-cycle motor must perform these same four functions with only two strokes of the piston; the 2-cycle working stroke forces the piston downward by the burning charge, and the piston itself acts as both exhaust and intake valves, by uncovering first the exhaust port at the lower end of the working stroke, and then the intake port very soon after the exhaust port is opened. When the exhaust port is opened the products of combustion which are under say 40 lbs. terminal pressure, rush out of the cylinder, and when the intake port is open the fresh charge, which must be under some pressure, is forced into the cylinder, so that both exhausting the burned charge and filling the cylinder with fresh charge must be done at nearly the same time, while the low piston uncovers the bottom ports. This seems an impossible performance. When the exhaust port opens the cylinder is full of flame which is instantly extinguished by opening the exhaust port and, at 750 revolutions per minute, the intake port is opened about one-five hundredth part of one second after the exhaust port is opened so that the fresh charge rushes in while the burning charge is rushing out; the fresh charge under pressure is directed upward by the "deflector" and has to go (supposedly) to the top of the cylinder and come back to the bottom of the cylinder before any part of this fresh charge can be wasted by going out of the exhaust port directly, but if the deflector is not the right shape the incoming charge may partly go out of the exhaust port and be wasted. When the piston is driven upward by the crankshaft in the compression stroke the intake port is closed first and then the exhaust port is closed and the charge is compressed ready to fire. when the piston reaches the top end of the compression stroke.

All this makes the economy and certainty of action of the 2-cycle motor depend first on the charge compression before it enters the cylinder, and second on the deflector form to prevent waste of the charge through the exhaust port. But with the charge pressure and deflector right, the 2-cycle motor is certain in action and very economical of fuel, impossible as this seems in view of the very short time for exhausting and cylinder charging.

The simplest form of 2-cycle motor sucks mixture from a carburetor into the crank-box and compresses this mixture by the working down stroke of the piston so that when the piston reaches the bottom of the working stroke and opens the intake port the mixture compressed in the crank-box will rush into the cylinder and partly fill it with mixture. In the best form this method can give about 1.7 times the power of the 4-cycle similar cylinder.

If the 2-diameter piston or a separate charging cylinder is used, no carburetor, and the cylinder is filled more than full of pure air, so that some air goes out of the exhausts port, and the liquid fuel is injected after the rising piston has closed the exhaust port, then no fuel can be wasted and the cylinder can be made to give more than twice the power of a similar 4-cycle cylinder.

The 2-cycle cylinder needs less cooling than the 4-cycle, although making twice the number of working strokes per minute at same speeds, because the charge is exhausted at the end of the working stroke and so does not have time to heat the cylinder.

With crank box pressure cylinder supply a 2-cylinder 1910 pound Elmore car did over 31 miles to the gallon, and a very heavy 7-passenger American Simplex car did better than 16 miles to the gallon of gasoline.

The 2-cycle motor can be made so as to be more simple and better for car driving than the 4-cycle motor.—H. D.

[An important point which has not been mentioned, and one which has deterred many a manufacturer from adopting the 2-cycle motor in his product, is the fact that it requires exceptional engineering ability and much experimenting and usually a large expenditure of capital to develop a satisfactory 2-cycle engine that can compete with even the ordinary 4-cycle motor, that can be easily built by almost any mechanic with sense enough to make a good copy of the other fellow's work. Although it may be possible to build 2-cycle motors with double the H. P. of a 4-cycle of similar size, such motors are conspicuously absent from the open market.—Ed.]

PLEA FOR A PRACTICAL RIG FOR THE WEST

[528] I want to purchase an auto for my own use and I have certain ideas as to what I want; so far as I have examined those on the market none of them conform to my idea. I will briefly tell you here what I should like and perhaps you may know of a car that will fill this bill.

A 4-cylinder, 2-cycle, 20 or 25 H. P. air-cooled motor of reliable and approved make, friction drive, double chains on sides close to wheels to permit high road clearance, chains housed. A light-weight but strongly built small car, racytype or roadster for two people, not under 100 inches wheel base and 60-inch tread; not less than 14 or 15-inch clearance; not less than 36x3½ tires, preferably 38x3½-inch; springs full or three-quarter elliptical, both front and back to insure great ease of riding. Only those experienced have any idea of our Western mountain and desert roads.

This car is for that work. Eastern makers still persist in low clearance, narrow 56-inch thread, hard riding semi-elliptical springs and heavy cars for this work. The man that can break away from the conventional, produce a car with a friction and chain drive, a light but strong car that can climb our awful grades, clear our rock roads, go where there is no water for radiators, go with speed and not wear out through hard riding springs, travel in our wagon-made tracks instead as now the ridges, would command a large sale in the West.

For five years I have been a steady traveler in all classes of the very best makes of large cars. They all go to pieces quickly. Weight will not stand up here, light cars are better. This is why I want to try a car stripped and of light weight, a car without valves, gears, clutches to get out of order, a friction that will hold and stand the slamming our roads are sure to give it. Nothing but such a chain drive will clear our rocks; nothing but a light car is light enough to climb our grades; only the most powerful brakes will hold.

SAN FRANCISCO, CAL. G. W. TIBBITS.

I do not know of anyone building the rig you want and I publish your inquiry in the hope that it will awaken interest in such a practical machine. It is an unfortunate fact that most of the buyers of autos do not know what they want, or if they have sufficient mechanical ability to know they are so fearful of criticism and so bound by conventionality that they will stifle their wants and buy the same as the other fellow, if right or wrong. This hampers progress and actually holds back the business. If the auto builders had lived up to the opportunity before them they would be selling self-propellers to the 500,000 buyers of horse buggies every year, not to mention the buyers of business and larger vehicles. That the auto field absorbs but 50,000 to 80,000 vehicles per year means that you are right. The air-cooled two-cycle engine is all right. I do not think you need four cylinders, but this depends on the weight of the rig. Some of the concerns who build friction drive cars should be able to substitute the engine you want instead of the water-cooled they usually furnish, and so supply you with what you need. You are also right about the light cars standing up. Flexibility is better than rigidity. The light hickory spokes of the American light buggy give results that have been a surprise to the rest of the world for years.—C. E. D.

Sometimes brake rods snap off at the ends, due to weakening of the same on account of threading. When this occurs the broken rods should be removed and the ends of the piece of stout wire should be passed through the spring holes and secured. Before starting the car the repairs should be tested thoroughly to make sure that the brakes will hold.

Oilzum

The Kind of Oil you'll tell your friends about

HIGHEST GRADE
THE WHITE & BAGLEY CO
OILZUM
for MOTOR CARS and BOATS
MOTOR LUBRICANT ON EARTH

Oilzum is the best of oils
Fred K. Burnham

Vice-President JAMES S. SHERMAN, who presented the CUP and Mr FRED K. BURNHAM, in F. I. A. T. Winne of Record of Hill, 45 4-5 seconds, Richfield Springs, N. Y., Aug 7, 1909.

This Car has a Mile Record of 33 2-5 Seconds, and holds the Record for 220 Miles with an average of 71 1-2 M'les p hour, when driven by LANCIA in VANDERBILT CUP RACE of 1906.

Mr. BURNHAM says:—"OILZUM has given me the best of service as regards lubrication and lack of carbon deposit

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Say what make of Car you have, state you "saw it in Cycle & Automobile Trade Journal and we'll mail you sample of the grade of OILZUM you should use and our Booklet, 'The O of Quality," FREE.

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In KANSAS CITY by KANSAS CITY AUTOMOBILE SUPPLY CO.
In LOS ANGELES by WIGNEY & TOMLINSON, 3626 Mehler St.
EVERYWHERE by Dealers who CARE for OIL that SATISFIES.

MANUFACTURED BY

Opinions and Suggestions

Under the above heading we will be pleased to publish letters from our readers expressing opinions, stating how they have overcome difficulties, or making useful suggestions. In this department will also be published longer communications or articles, of either a general or technical nature.

WHO MADE THE FIRST AUTO?

[509.] As a constant reader of your Journal I kindly ask you to answer these few questions in the columns of your Mechanical and Technical Department:

1. Which was the first foreign country to manufacture automobiles, who was the maker and what was the machine called?
2. What was the first American machine made, where was it made and what was the manufacturer's name?

CHICAGO, ILL. E. L. HESS.

Automobiles are so old that it is hard to say where they were first made. Steam automobiles were in quite successful use in England 75 to 90 years ago, and were the predecessors of the locomotive and railway train.

The first gas engine auto was built by Lenoir in Paris about 1862. This was not followed by others, however. To Gottlieb Daimler, of Germany, is given the credit of producing the first light engine, which has made the modern auto what it is. He made a motorcycle in the latter part of the 80's, but so far as I can see the records, Carl Benz was ahead of him. Benz had a clearer conception of a practical vehicle than Daimler, and in 1885-6 took out patents on a really practical rig. Many thousands of these rigs were built and running to-day in many parts of the world. I think he was the first to commercially get into the market with any quantity of goods, and that the credit belongs to Germany. But France is usually given the credit. The Panhard Co. took up Daimler's ideas and made a success of them. Serpollet, a Frenchman, built a little steamer that ran well. And a French journal had enterprise enough to promote a contest and get these rigs together, and in front of the world about 1894. This enterprise bore such fruit that the world has for years looked to France for its ideas in autos. France was the first country to largely engage in the manufacture of the new vehicle. Panhards, DeDions, and Bollees are among the earliest French vehicles.

Steam autos had been made in America from time to time from the days of Fitch, about 1780. Electrics were also experimented with after 1876. The gasoline auto did not make its appearance till about 1891, in which year I began one and finished it in 1892, about two years before any other maker. This was made at Springfield, Mass. Henry Ford started to build a motorcycle about this time, but finished it as a small four wheeler about 1893. He did not do more work in this line for some years after, however, whereas this first Duryea vehicle was the beginning of a line, not large, that has continued steadily down to the present. Elwood Haynes, of Kokomo, Ind., finished his first rig in 1894, and has steadily continued since.

These facts may seem to be contradicted by the recent court decision sustaining the Selden patent and by the pictures published of a rig marked 1877, but the fact is that Selden did not finish his first gasoline vehicle till about January, 1906.

Although Duryea vehicles were the first to be put on the market for sale it is but fair to say that the Winton took the lead in point of numbers about 1897 and held a leading position for several years.—C. E. D.

BANKING AND CURVATURE OF TRACKS

[518.] The people here wish to construct a two-mile automobile race track. Can you give me data, or refer me to a treatise on the subject of automobile race tracks? What I wish to know particularly is: First, what shaped track is most desirable; second, what degree of curvature a machine will take, at 60 to 100 miles per hour, with curves properly elevated; third, what is the proper elevation? An approved formula for determining the proper elevation of curves of different degree at different rates of speed will help considerably.

DALHART, TEX. JAS. A. STINSON.

Racing is out of my line. Since road vehicles attained speeds above legal limits I have lost my interest in speed and so have not preserved data along the line you ask. Better get in touch with the engineers of some modern track. The Indianapolis Speedway managers spent much money to get a fine track and their engineers undoubtedly collected much data which they will doubtless be glad to aid you with. The shape of the track is usually made to suit the ground available. To permit spectacular speed in front of the grand stands it is quite common to have straight stretches there. This usually makes a track elliptic or ellipsoid in shape. If not circular it should be truly elliptic in order that the cars may enter the curved portion easily. To go from a straight part into a curve abruptly is not conducive to safety nor to high speed. The proper banking is a matter of the amount of curve and of the probable speed to be provided for. Theoretically the banking should be such as to counteract the centrifugal force due to the speed and the curve. But practically it is much less to reduce the cost of the track and to lessen the erosion of water. If shape can be made as desired the cheapest and fastest is with long, straight stretches and with elliptic ends properly banked.—C. E. D.

HOW TO BECOME A SALESMAN

[519.] I am a reader of the Trade Journal and trusting in your wide knowledge of the automobile business, would like some motor car advice. I would be pleased to have you answer by enclosed self-addressed envelope. I am a young man eighteen years of age, a graduate of a good high school and would like to take up automobile salesmanship. I have a good knowledge of the automobile, obtained by study and observation, but no practical knowledge. What department would you advise me to associate myself with? Is it, in your opinion, better to be factory salesman or salesman for an agent? Is it necessary to obtain work shop experience? In general, what would you advise me to do, to become a salesman?

BELLEVUE, KY. R. H. NEWTON.

The important thing is to get busy. Take the first opportunity open and make the most of it. Get some driving experience. You must actually know, and the more fully you master the subject the more successful you can be as a salesman. A workshop experience is not necessary, but the ability to do anything needed about the car is valuable.—C. E. D.

KINKS

Turnbuckles of quick detachable rims often become rusted through constant exposure to mud and water and their removal becomes a difficult task. If kerosene be applied to the threads of a rusted turnbuckle it will facilitate the loosening of the latter. Recurrence of the trouble can be prevented by applying a mixture of graphite and glycerine to the threads which will repel water and rust.

When lubrication is accomplished by a system of force feeds, the adjustment of the various feed supplies is of very great importance. Each feed tube should carry to its destination the amount of oil required, but not an excess. The exactness of this requirement, and the uncertainty of getting the supply just right, is the objection to all force feed oilers. The sight indicator on the dash frequently does not tell the truth, and trouble of a serious nature may follow. The only safe method of adjusting is to disconnect the terminal end of the feed tube and see that the proper number of drops of oil is delivered from the open end each minute, with the motor running at an average speed. The correct amount can be ascertained by tests or often from the makers.

Ball bearings should be adjusted so that there shall be a very slight slack. This is usually secured by turning the movable ball cone one-fourth of a turn back after turning it up until it is snug.

In making any adjustment it is important that the party making the adjustment shall know positively what effect will follow the turning of an adjusting screw in either direction, and also how much effect is to be expected from one or more turns of the screw. If the carburetor or force feed lubricator is not perfectly understood, it should be removed from the car, dis-assembled and studied carefully to learn its action.

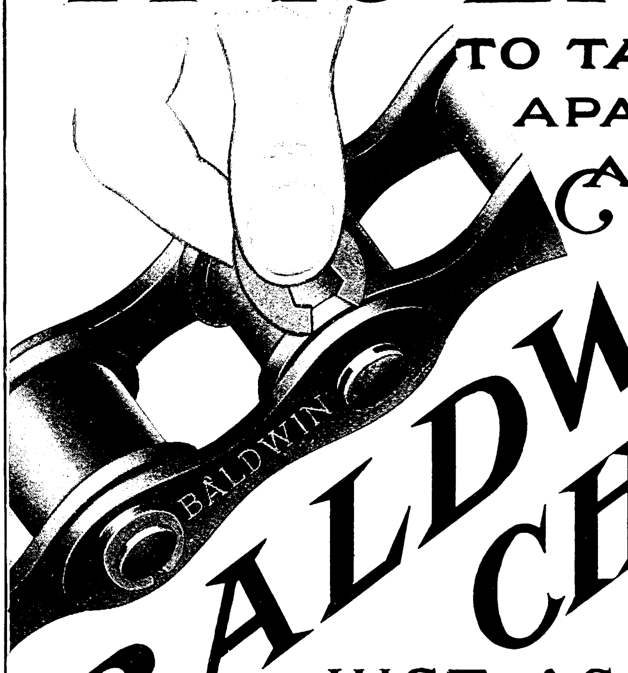
Shock absorbers on opposite sides of the car should be adjusted with great care, so that the tension is equal, otherwise the tendency is for the chassis to be racked and strained under usage, exactly as would be the case were the rear springs of different strength. The shock absorbers applied to the front and rear ends may be differently adjusted without injuring the chassis.

Inner tubes are sometimes caused to leak due to relaxation of the nut which clamps the stem to the tube. When this is slackened the pressure of the air contents of the envelope may be sufficient to hold the outer wall against the seat on the under side of the washer, thus preventing any escape of air under ordinary circumstances, but not strongly enough to hold when the stem is bent or pulled out of line. To test a tube which shows up good in all other respects, the only safe way is to twist the stem back and forth under water sufficiently to pull the rubber slightly where it lies against its stem.

One way to temporarily remedy the slipping of a leather-faced clutch is by withdrawing the cone member and forcing between the points of riveting, bits of matches or small pieces of wood which will slightly force the leather away from the metal, thus giving about the same results as if the clutch spring had been tightened.

It is said that the best way to cross newly laid stones is to run the car declutched over the section at as low a speed as possible, that is, the driver should take the patch declutched sufficiently fast to land just clear of the stones on the other side. If the stretch is a long one it is considered best to run on the low speed, and as slowly as possible, thus greatly reducing the driving impact and saving the tires to the utmost degree.

IT IS EASY



TO TAKE APART A

BALDWIN CHAIN

AND JUST AS EASY TO PUT IT TOGETHER AGAIN

In emergency a wire can be substituted for the washer. This type of detachable chain is as durable as a riveted chain. Suitable especially for trucks. The new detachable feature is gaining favor and meets the demands of the trade.

SPROCKETS

We are prepared to quote on sprockets in large or small quantities and are equipped to meet competition in all parts of the country.

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WHAT USERS OF THE Woodworth Treads

Say About Them

These speak of the 1909 treads. The 1910 Improved Self-Adjusting Tread is even better

Phila., Pa., 10-12-'09.

Leather Tire Goods Co.,
Niagara Falls, N. Y.

Gentlemen:

I have used the adjustable Treads before, and if your new Improved Self-adjusting Tread wears as well, I have nothing to complain of.

Enclosed please find check for which please send me a pair of the Woodworth Improved Self-Adjusting Treads for 37x5 tires.

Yours very truly,
S. A. Steltz.

Halifax, N. S., Oct. 12, '09.

Leather Tire Goods Co.,
Niagara Falls, N. Y.

Gentlemen:

Judging from the cuts and reading matter, I think your new tread seems to be all right. I like the new style stud and think it is going to be an improvement over the hat-shaped stud, as there is more wearing surface and it will not be so apt to take hold of the ground and tear out.

As you did not send those extra studs in time for me to repair my treads, they are now about all in. They have been run about 3500 miles and I feel very well satisfied. They have saved me a lot of tire expense and have been a good investment. I have not had any of the troubles that some of my customers have had, and only had to take up the buckles once on account of the tread slipping. I have never had a puncture in those tires and only had to exchange one tube on account of bad valve. This was done without removing the tread. I have taken the treads off three or four times, once last winter to paint the rims and another time to change the tires from front to rear, and I have never found mud under them or bad effects of any kind.

I have my car just about sold now and intend to buy a five-passenger car for my own private use, and probably a runabout for the Firm's use next year, and I shall certainly put treads on the rear wheels of both cars before they are run at all.

Yours truly,
Hillis & Sons, Ltd.

Sherman, Texas, June 7, 1909.

Gentlemen:

I have made such an excellent record with your treads on my personal car that two of my friends want them. I bought a Reo car that went into use about the first of March, 1907, having been in service about 27 months. The car was equipped with your detachable treads when it was first started and has probably made between 20,000 and 25,000 miles, and up to date I have never seen an inner tube on this machine. Not a single puncture, not a blowout, and my tire troubles have been nothing.

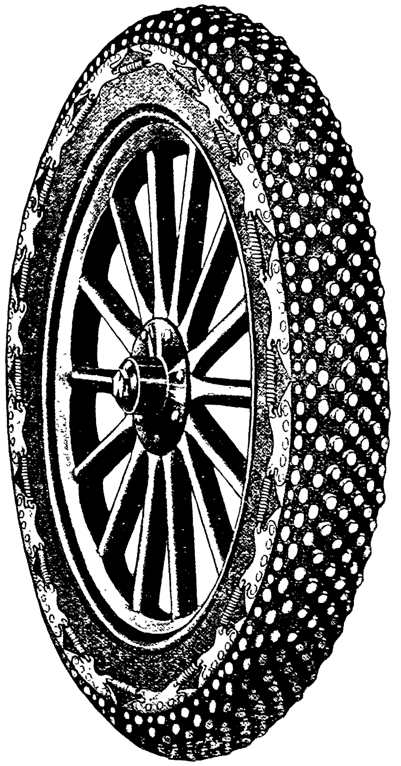
Yours truly,
Eugene Cherry.

LEATHER TIRE GOODS CO.

NIAGARA FALLS :: :: :: :: :: :: NEW YORK

Reduction in Tire Expense

In spite of the fact that tires have gone up in price and are going still higher you can reduce your tire bills to about one-half of what they have been and do away with tire trouble—punctures, skidding, etc.,—by using WOODWORTH TREADS.



The 1910 Woodworth Improved Self-Adjusting Tread

is more durable, neater in appearance and easier to apply than the older styles.

The new coil spring adjustment allows the cover to stretch enough for any make of tire and automatically holds the TREADS at just the right tension.

Anyone can quickly and easily fit them to any make of tire.

They cannot be put on wrong.

The springs always hold them snug and smooth so they cannot injure the tire.

The leather of the new Tread is treated by a new process which keeps it soft and pliable so that it never cracks or breaks up between the rivets. This with an improved rivet makes them give about double the mileage of the older styles.

PRICES:

28x3	- $10.75	32x4	- $18.50
30x3	- 11.75	33x4	- 19.25
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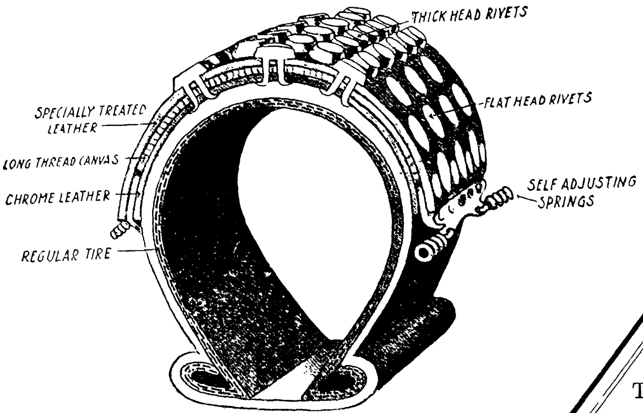
32x3½	- 15.75	36x4½	- 24.50

Other sizes in proportion.

We deliver them express prepaid where we have no agents.

Send coupon for circular and get posted on how to save money and feel safe from tire troubles.



LEATHER TIRE GOODS CO.
NIAGARA FALLS, N. Y.
Canadian Factory at Niagara Falls, Ont.]

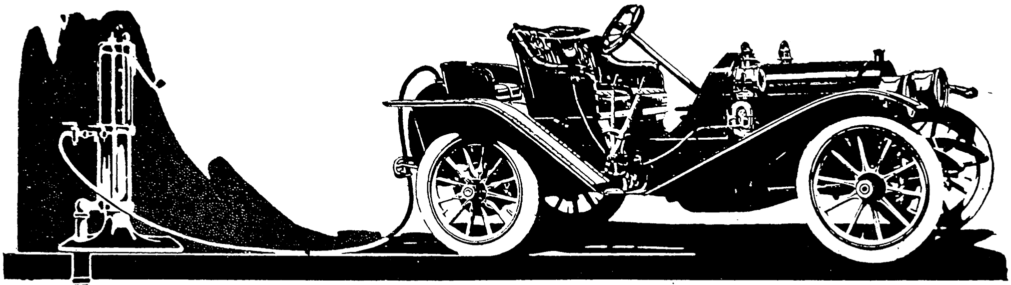
Leather
Tire Goods
Company,
Niagara Falls,
N. Y.

Send me circular giving description and prices of the Improved Self-Adjusting Tread.

Name ____________________

Address ____________________

____



Every Owner of an Automobile Using Gasolene Should Provide for the Proper Storage of Fuel

Safety, Economy and Convenience are among the many advantageous features embodied in the Bowser Gasolene Storage System.

This Equipment is especially adapted to use in private, as well as public garages. You need have no fear from explosion with a "Bowser." One hundred eighteen Bowser Gasolene tanks were dug up and the gasolene emptied after the San Francisco fire. You are able to purchase gasolene in such quantities as to obtain economical prices. Your tank is buried outside, the pump inside accurately pumps and accounts for the gasolene used.

The Bowser Underground Storage System has proven beyond the question of a doubt to be the only practical method for storing gasolene, and has been accepted as the standard garage equipment throughout the country.

The Bowser System provides for the needs of every owner, no matter how small or how large the fuel consumption. It saves more by preventing loss from evaporation. It provides more miles to the gallon by keeping the gasolene in its original state. It provides a ready supply so that your car can be filled every morning. SEND FOR CATALOG..T.

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BOWSER

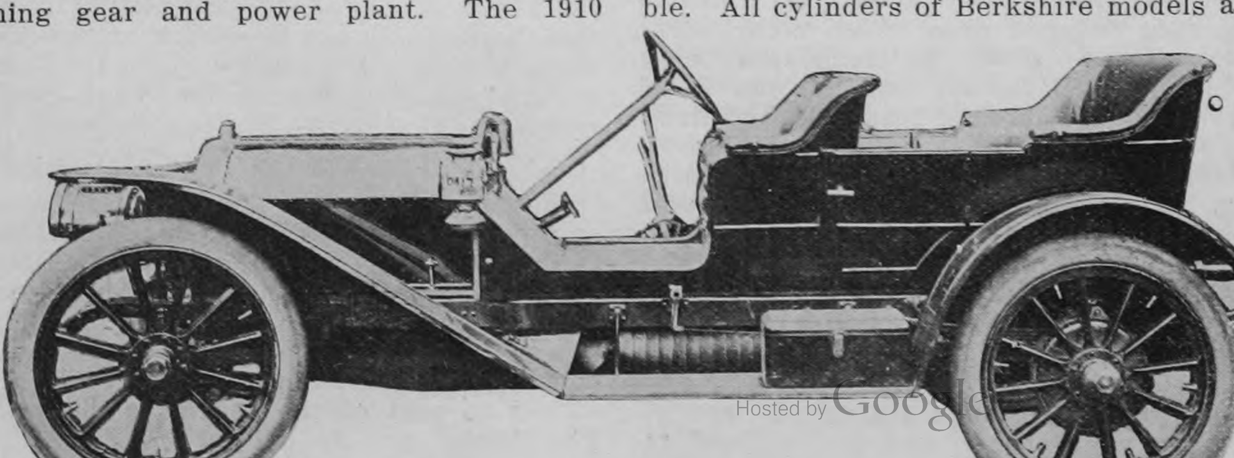
BERKSHIRE FOUR

BY C. E. MORRIS.

Of rather attractive design is the 1910 35 H. P. four cylinder water cooled Berkshire, made and tested in the Berkshire Hills, and, at the price, it is one of the most capable cars in its class. Obviously a car built among the Berkshires must needs be an able hill climber, must have an abundance of power in reserve and all this marks this snappy car built by the Berkshire Auto-Car Company, of Pittsfield, Mass. Many novel features of construction are found in its design and of these the flat seat valve is noteworthy. This feature of construction tried out on other cars of domestic origin and discarded because of alleged inefficiency is in the 1910 Berkshire developed to the highest limit of efficiency, in fact, all previous Berkshire models have employed the flat faced valve and because of the satisfactory results attained in the past it is retained and perpetuated in the 1910 production. The standard 35 H. P. four cylinder Berkshire car sells for $2,900 and all other models, save for a shorter wheel base, as, in the case of the toy tonneau and runabout types, employ the same running gear and power plant. The 1910 Berkshire is the design of chief engine
E. B. Belcher and in his latest effort a
reflected generous thought to detail, r
finement of design and obtaining the hig
est efficiency for the material used and
the price at which the car sells. In fa
it may be said wih due regard for the tru
that in this the 1910 Berkshire are fe
tures of construction which one could n
really expect in a car selling in its pri
class. The up-to-date multiple disk clut
is used, and on this particular car und
the most strenuous of tests it has prove
eminently satisfactory.

MOTOR.

The motor of the 1910 Berkshire Fou
is of the well-known T type and is of ne
design, the valves of course being plac
on each side of the cylinders and actuat
by two cam shafts. The water jacke
are cast integral and completely surrou
the valve chambers, each cylinder bei
anchored to the aluminum crank case l
⅝-inch steel studs. By the employment
the single cast cylinders, a five beari
crankshaft with liberal bearings is poss
ble. All cylinders of Berkshire models a



other processes of finishing. All valves are of special alloy nickel steel, flat faced, ensuring a complete scavenging of the spent gases and the prompt admission of he fresh charges. All valves are interchangeable and are 2¼ inches in diameter, springs are of steel. The cylinder bore s 4 11-16 inches, stroke 5½ inches, engineer Belcher being an advocate of the

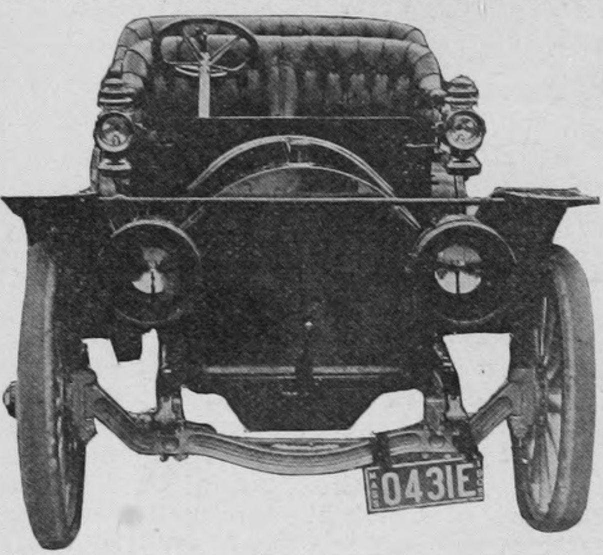


Fig. 2. Front view of 1910 Berkshire, showing fender supports and lamp brackets, also the milled out I-beam drop centered axle and reversed Elliott steering knuckles.

long stroke motor, and firmly convinced of its added advantages. In actual service the long stroke has proven most efficient. There is a lift of 7-16 inches on the exhaust valves and ⅜ inches on the inlet. Provision is made for adjustment on the vertical push rods. The cam shafts are of special alloy steel, cams being integral and for bearings plastic bronze is used. The valve rollers are housed in bronze guides which are bolted to the crank case, the rollers and lifters being of hardened and ground steel. The pistons are of selected cast gray iron fitted with four eccentric ground rings diagonal lapped, all carried above the wrist pin. There are four oil grooves. The wrist pin is of hardened and ground alloy steel. The connecting rods being of drop forged nickel steel I-section, the wrist pin connection being solid, grooved for oil and the pin itself is bushed with bronze bosses and retained in place by two ⅜-inch steel set screws which prevent sidewise motion, or turning. The crankshaft having five liberal bearings is an anvil forging of special alloy steel and of expensive construction, that is, the hogged out or sawed out type. It is 1¾ inches in diameter, the rear bearing being four inches long, while the others are two inches long.

The motor bearings throughout are of Parsons white brass and are retained in

All motor bearings are retained in the upper crank case section, the intermediat members being held in place by two stee studs while the front and rear member are retained by four studs. The uppe crank case section forms one-half of th timing gear housing, the other half o course, being a separate member. Timing gears are of steel and bronze, lubrication being by splash. While the uppe section of the crank case retains the motor bearings, the lower half is used primarily for the oil supply, the upper sectio having the supporting arms cast integral

OILING SYSTEM.

The oiling system of the 1910 Berkshir is novel and positive. The oil carried i the lower crank case section is lifted b a gear pump located at the lowest sectio of the oil reservoir and removable throug the case without disassembling the case the supply being strained through a 120 mesh brass screen, so that the pump circulates clean oil only. The oil is raise to the sight feed on the dash and thenc passes through a brass leader ⅜ diamete having 5 copper leads to the main bearings. The pump is actuated by a gear o the cam shaft. The faces of the cran pins and the faces of the crank webs ar drilled with ¼-inch holes so that the is a circulation through these drilled lead to the bearings. Each of the five coppe leads from the main supply carrie through the ⅜ brass pipe discharge int the center of the bearing blocks an through the white brass bearings to th face of the crank bearings, so that, ther is a continuous flow of lubricant to th pins at all times. So efficient is this system of force feed lubrication that it i really unnecessary to carry an excessiv quantity of oil in the crank pits. On th contrary one need not avail himself o the splash lubrication unless he so desires An additional amount of oil in the lowe crank case section poured through th breather of course assures a dip bath fo the crank pins and the connecting rods this, however, is not necessary to the efficient working of the motor. There is a oil ring at each end of the crank shaf which obviates oil leaks along the shaft.

IGNITION DETAILS.

Ignition is double, that is there is storage battery and a Bosch magneto whic is furnished as regular equipment, as th source of current. The dash of the Berkshire is comparatively free carrying onl the sight feed oiler, the Bosch single uni coil and self starter, the latter being furnished as part of the regular equipment The Bosch coil is of the non-vibratin

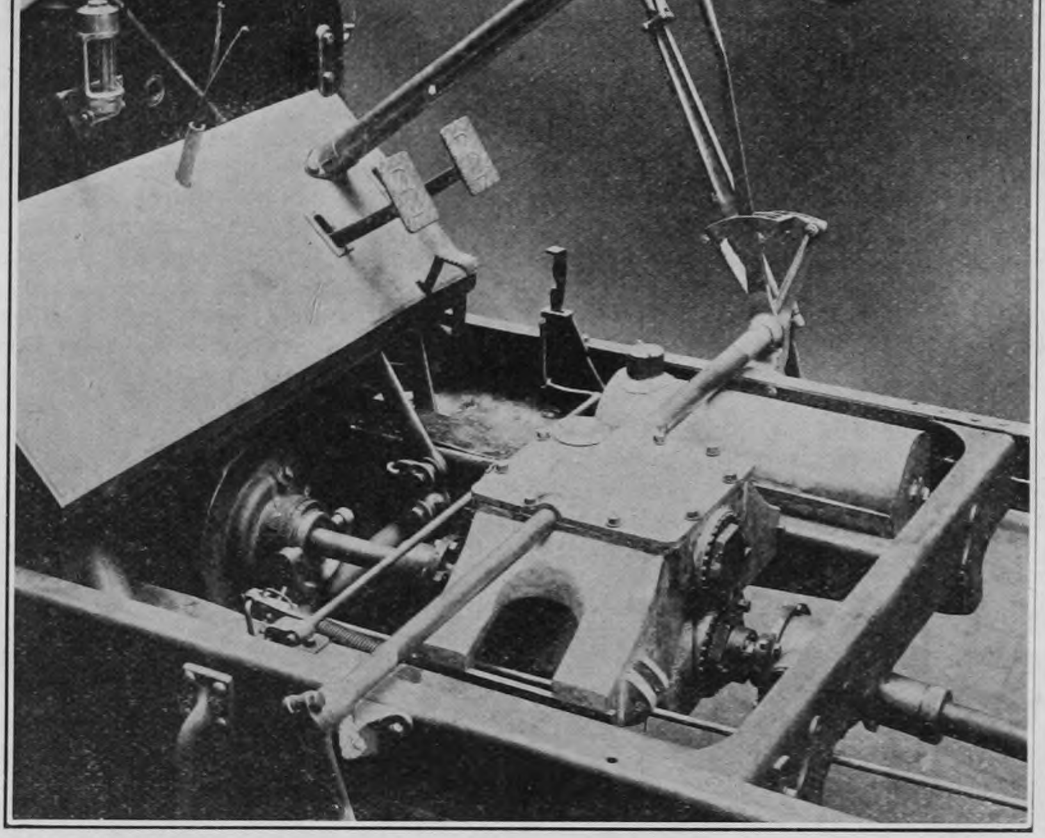


Fig. 3. Control details of 1910 Berkshire Four. Transmission is supported at four points on the sub-frame, multiple disc bronze housing, muffler cut out lever with locking notch, foot pedals and accelerator, clutch yoke an short driving shaft between the clutch and transmission. Gear shifting lever works just underneath the transmission case cover; auxiliary oil tank holds two gallons, note substantial rear anchorages of the motor and transmission sub-frame which is made of pressed steel hot riveted.

chamber. The high tension magneto is driven off the cam shaft through a universal joint on the left side of the motor, and is fitted with its own distributor, there being four short cable leads to the respective plugs, one set serving for the battery system. The ignition cable lead secured to the heads of the cylinders is of fibre construction.

The inlet side of the motor is the right, the exhaust being on the left. The inlet manifold is of neat design of aluminu 1½ inches inside diameter, the carburet being of the automatic type and wat jacketed, the water for jacket circulatio being forced by the water pump on th left and discharged into the jacket of th number 2 cylinder on the right. A featu of the regular equipment is the muffler c out which may be locked in the cut o position and which provides a direct dow ward discharge of the gas, being actuate by a pedal. The exhaust manifold is cast iron, the lead to the muffler bei steel tubing two inches in diameter. Coo ing is of course by water the centrifug pump being located on the left side the motor and driven from the cam sha A brass idler serves as the pulley dri for the fan. All water piping is of coppe the pump supply being drawn from th bottom of the radiator and lifted throug the water manifold to the base of the cy inder jackets on the left side of the mot and passing outward through the hea of the jackets and back to the radiato

THE MULTIPLE DISC CLUTCH.

The motor fly wheel is of cast iron inches in diameter and has a four a one half inch face. The multiple di clutch is contained within a bronze ca bolted to the motor fly wheel and is co

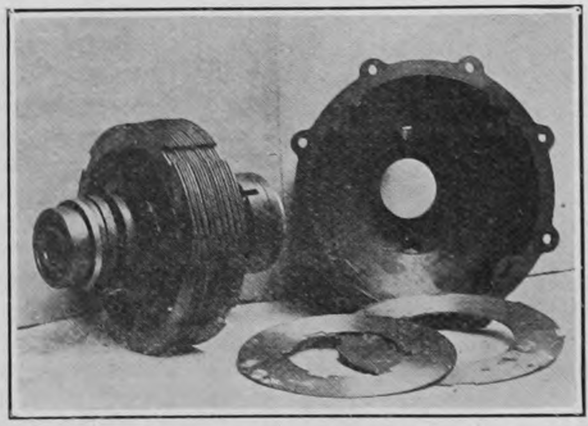


Fig. 4. Multiple disc clutch partially disassembled. The Berkshire multiple disc clutch is built up of 36 hard-

ple during the course of a demonstra- on of the car. All end thrust is taken o by a Hess-Bright ball thrust located etween the clutch and fly wheel.

The clutch yoke is of drop forged steel, mple in construction and effective in peration. Final drive is through a nickel eel propeller shaft fitted with two uni- ersal joints, the shaft being 1⅝ inches diameter. The connection between the utch and the transmission is a short ckel steel shaft with squared ends.

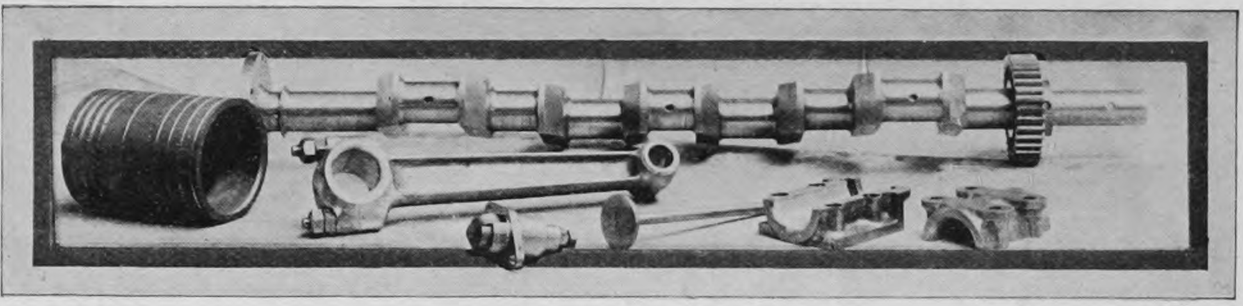


Fig. 5. Component group showing piston of cast gray iron, steel connecting rod, valve roller and bronze guide, flat seated nickel steel valve, bronze bearing box with Parsons white brass bearing held in place by a dove tail arrangement. The Berkshire crank shaft shown, is of the five bearing type, the pins being two inches long and 1¾ inches in diameter. Note holes drilled in the center of the pins. Oil circulation is forced through centers of main bearings, assuring positive lubrication at all times. Connecting rod bearings channeled for oil delivery. Note oil rings on crank shaft. The faces of the webs are also drilled so that there is a circulation of lubricant to the connecting rod bearings. Splash feed is optional.

THE TRANSMISSION AND GEAR RATIOS.

The transmission is of the selective ype having three forward speeds and re- erse with direct drive on the high gear. ars are geared in accordance with the se that is to be made of them, for in- ance, the standard touring models are eared 3 or 3½ to 1 the same gearing eing ample for the limousine types, hile the pony tonneau and runabout mo- els are geared 2½ to 1, on which gear ills may be made without undue exer- on on the motor, as was conclusively roven in the course of a demonstration ver Lebanon mountain with three peo- le in the car, the grade being about hree miles long. Also with this gearing here is possible a wide range of speed o meet all demands and the car may be operated sufficiently slow on the high ear for city work. The transmission ears are of chrome nickel steel hardened nd ground, bearings being of the Timken oller type and shafts are of chrome nickel eel. The gear shifting lever is carried ose to the top of gear case cover. An terlocking device on the gear shafts pre- ents more than one combination being orked at the same time.

REAR AXLE.

The rear axle is of the full floating

hubs, so that the drive is through the hubs. The differential case is of pressed steel and being in itself a truss no truss rod is required. The gears are of chrome nickel steel and the driving shafts of nickel steel 1⅝ in diameter, bearings being Timken roller. The differential gears may be removed without disturbing the adjustment by unbolting the face plate of the housing.

A V-shaped torsion tube is fitted, being formed by heavy gauge steel tubing and provided forward with a spring buffer, anchored to a cross member of the frame, the rear end being anchored to the differential housing.

THE BRAKES.

There is ample provision for breakage, either set being sufficiently powerful to check the car with ease. Both sets work on the pressed steel drums bolted to the rear wheels. One set of brakes work on the outer faces of the drums and the other set on the inner faces. The drums are 14 inches in diameter by 2½ inch face, lined with thermoid asbestos. Steel cables are used, cables being self-adjusting, and provision is made for adjustment of brake bands by a thumb screw and lever spring device. The foot brake actuates the external contracting bands and the hand side lever the internal expanding shoes. The brake bars are provided with distance rods. Not only is the positive alignment of the rear construction assured by the staunch torsion tube but also by side turnbuckle adjusted strut rods of drop forged I-section steel construction.

The side members of the chassis are inswept forward to give a short turning radius and are upswept at the rear. The frame is of pressed steel hot riveted being strongly cross braced and the cross members are provided with integral gusmission being by four points.

THE SPRING SUSPENSION.

The front springs are 34 inches long, have ten leaves graded and lipped 2 inches wide and are perched 2 inches off center, special spring steel being employed. The rear springs are 42 inches long having 10 leaves, graded and lipped 2 inches wide and are shackled at both ends. The rear spring hangers are of the goose-neck type provided with a non-turning over shackle while the forward ends are anchored to drop forged steel shackles which also serve as anchorages for the drop forged steel side strut rods and the rear springs oscillate or swivel on the axle tubes.

The radiator approaches the square tube design of a perfected type and is of ample storage capacity, which with the belt driven fan provides a generous supply of cooling water under all conditions of service. The front axle is strong in appearance and is a little heavier than need be but like the side strut rods, the stout springs, having more leaves than are generally used, it is but another added factor of safety and of these there cannot be too many under present conditions of extended pleasure touring over all sorts of roads. This front axle is of drop center formation, the I-beam effect being obtained by milling, a forking in one continuous piece of chrome nickel steel. It is 1⅝ inches wide, and 2½ inches deep.

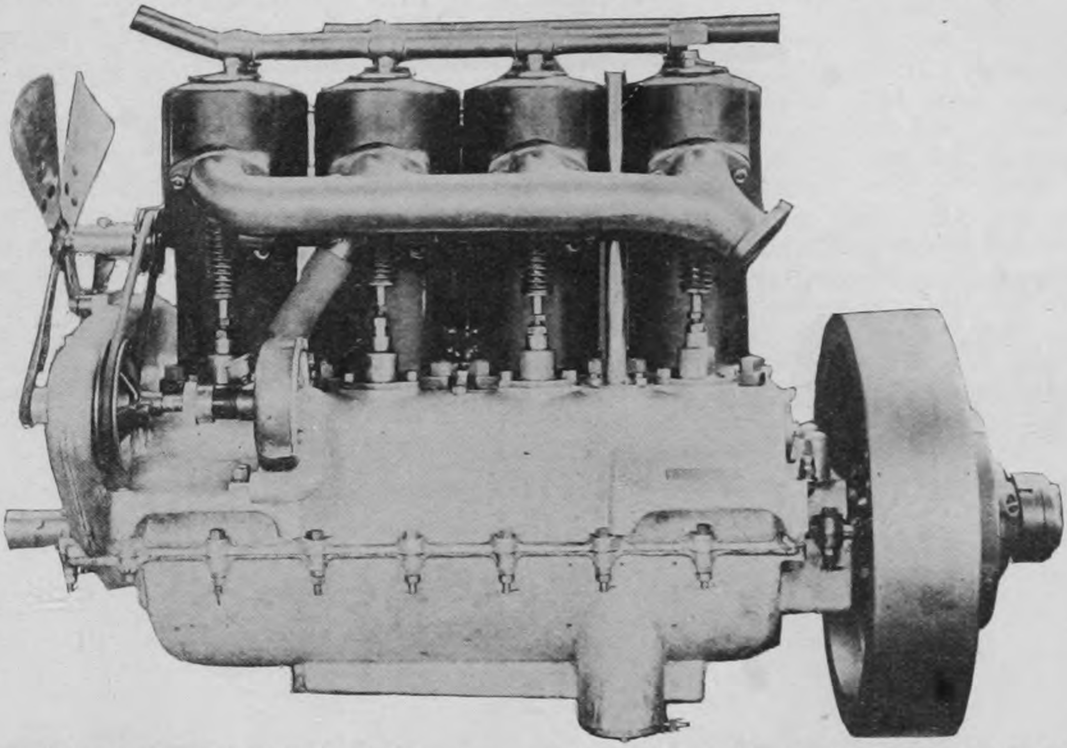


Fig. 6. Exhaust side of Berkshire 1910 T type motor, cylinders cast separately which makes it possible to empl
a five bearing crank shaft. Note oil well in lower section of crank case, water pump and liberal exhaust manifol
Flat seated valves as used in the Berkshire 1910 motor make for speedy and complete scavenging of burned gase
Upper crank case section forms half of the timing gear housing.

sufficient size to ensure positive spring
chorage. The steering knuckles are
the inverted Elliott type drop forged and
steering pins are 1 3-16 inches in d
meter turning in hardened and grou
bushings in the knuckle. The drag l
of the cross steering connection is of st
tubing of heavy gauge while the cr
connection itself is drop centered to c
form to the shape of the axle and
carried behind it free from road obstr
tions.

The steering gear is of the irrever
ble type with worm and sector, adju
ment for wear being provided througho
The steering connections are fitted w
ball and socket joints. The worm a
sector are hardened and ground and l
ped into place, another precaution to
tain accurate assembly. The steer
column is of heavy gauge steel tub
fitted with an 18-inch hand wheel,
column being 1¾ inches in diamet
The spider of the steering wheel is
aluminum, the spark and throttle lever
ing located above the spider, working o
quadrant. The foot accelerator is c
veniently located on the floor board a
actuates the throttle regardless of
lever on the steering wheel.

Wheels are of the artillery pattern b
of selected second growth hickory, th
being 12 spokes in both front and r
members. They are 36 inches in d
meter and the roller bearings

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of the car under the driver's
at and a hand force pump provides for
livery from this tank to the crank case.
el, fed by gravity, is carried in a 16-
llon tank located under the driver's
at. A metal under pan completely houses
e motor and transmission and large fend-
s protect the occupants from the mud
water thrown up by the wheels. The
nders have a long graceful sweep. The
rward fenders are not secured in the or-
nary manner but instead a strong steel
pport for both fenders and lamps is

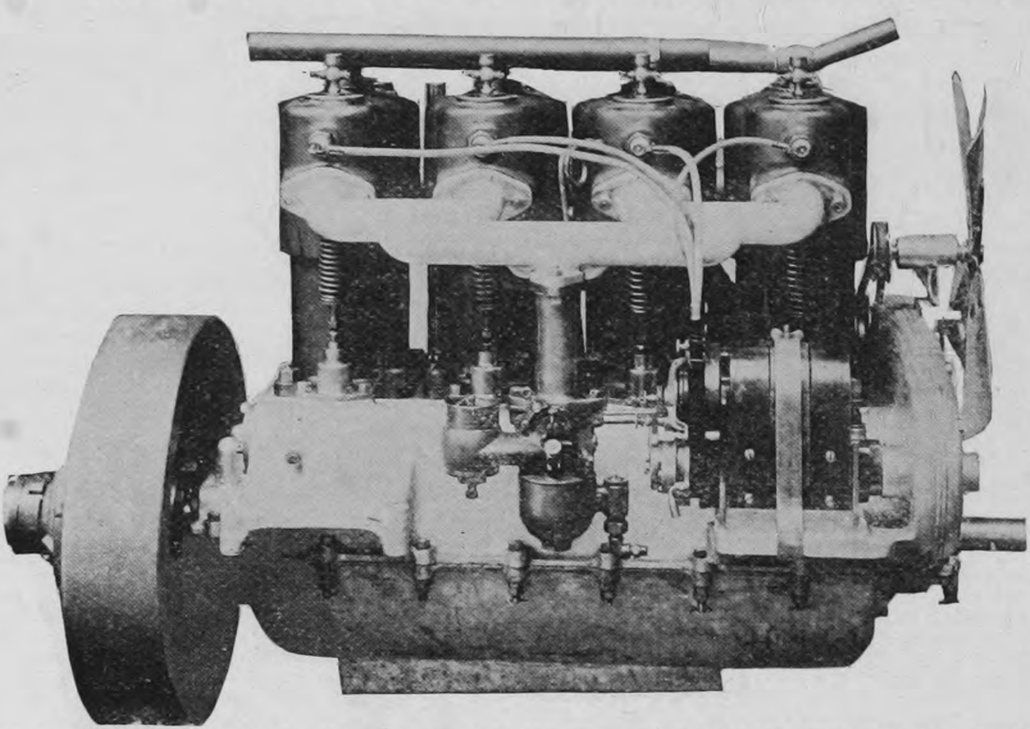


Fig. 7. Inlet side of Berkshire 1910 motor. Note the trim and symmetrical inlet manifold, simple wiring of
nagneto, water jacketed carburetor of the automatic type. Note magneto anchorage. The Bosch high tension type
s furnished as regular equipment in conjunction with the Bosch ignition coil and self-starter. Magneto is driven
hrough universal joint from the timing gear shaft.

ted. It consists of two vertical side
embers secured to the chassis side
embers, and at the highest point of these
joined a cross member which extends
fficiently over the wheels to act as a
pport for the fenders. The lamp
ackets are also brazed to these up-
ght members so that the whole forms
integral unit of strong construction and
viates that annoying rattle of lamps and
nders so common on many cars, es-
cially when the clutch has been disen-
ged as in coming suddenly upon crowd-
traffic and the engine must for a time
ce a bit. The lamp brackets are carried
dway between the top and bottom of
e vertical members.

The bodies of Berkshire cars represent
e best in construction and are nicely
ished, the standard color being maroon
dy with English vermilion running gear
hich makes a harmonious combination.
her color schemes are obtainable, of

The standard touring car sells for $2900, the runabout and toy tonneau at $2650 and the landaulet at $3500.

ON THE ROAD.

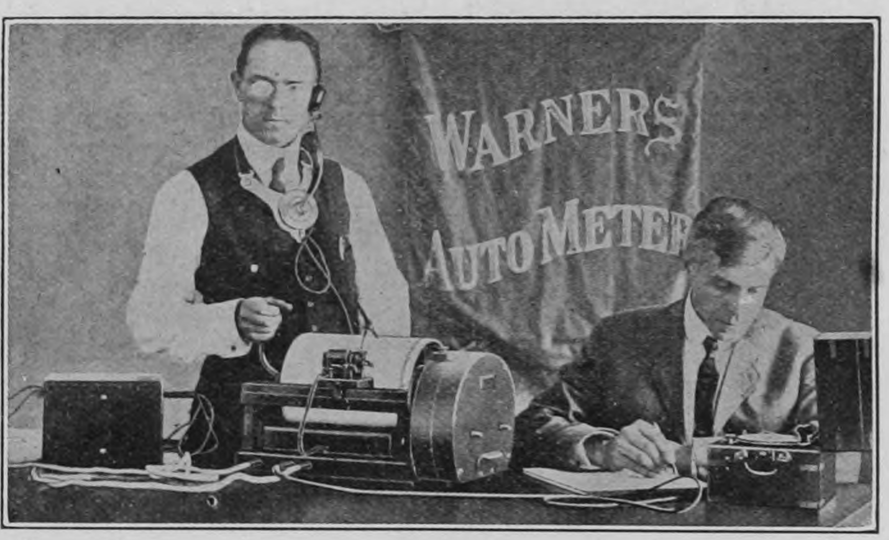
The best proof of the worth of any car is the manner in which it performs on the road, up hill and down, under all conditions. The writer was given a road demonstration of a Berkshire toy tonneau model, Thomas Clarey at the wheel. Pittsfield was left at 10.45 A. M. for a run over the roads through New York State, Pittsfield being of course close to the State line. The roads in that section of the country, that is the main traveled highways, are very good and conditions are ideal. After leaving Pittsfield and making for Nassau, over in New York State, this route, while not as long as some that might have been followed, was rather hilly and a good test of the car as it was geared 2½ to 1. Just outside of Pittsfield there is a long hill which was surmounted without difficulty, though the motor was throttled down by the driver as a demonstration of the capability of the car at hard work on the high gear. A car geared lower obviously would make the hill somewhat easier but no attempt was made to rush the grade as would be done under ordinary touring conditions. Other cars with a lower gearing bound in the same direction were easily passed without the slightest strain on the motor. From the top of the Lebanon grade one has a long coast down into the valley which leads in-miles was made in 1 hour and 35 minutes, yet no attempt to speed was made.

On the run back Lebanon was a different proposition than on the trip over to Nassau, for while the roads were good, yet it was a long, hard climb and the car behaved splendidly. John McQuade, president of the company, accompanied the writer who sat on both the front and rear seats and on either the passenger was comfortable, the absence of vibration was noticeable. During the entire trip re-

formed exceptionally well. A test o brakes revealed that either the foot or th hand lever were positive, and in respons to the throttle the motor accelerated ex ceptionally well, yet during all was ver quiet in operation, the clutch workin smoothly. The roads in that particula section of the country while they are goo abound in steep grades, so it is doubtfu if a more lengthy demonstration woul have brought out any more conclusivel the efficiency of the 1910 Berkshire.

HOW SOME OF THE RECENT AUTO RACES WERE TIMED

The timing arrangement, which is manufactured by the Warner Instrument Co., of Beloit, Wis., consists of a revolving drum covered with a ruled sheet of paper, on which a pen traces a spiral line. Whenever a car passes the wire, the pen is pressed to one side and held there for an instant, leaving a deep indentation in the line on the paper. The paper is ruled across for every five seconds that the pen travels, and besides this, the pen is arranged to mark seconds so that each second is shown by a notch in the line. Each line has sixty notches and covers one minute. Every ten minutes an extra wide space is left between the lines.



The "Warner" Timing Instrument.

Two men are required to keep the record. One of them watches the cars as they pass and calls off their number and time to the other, who sets it down on a separate sheet as shown in the cut. For instance, as a car approaches, the man standing at the instrument calls the car number, and presses the key that he is holding in his right hand to connect the instrument with a wire that is stretched

The operator calls off the time of tha car at once in minutes and seconds, an tenths of a second. The man seated be side him enters it on the Race Time She in the proper space, and by making th subtraction secures the elapsed tim which is posted on the score board. Th track wire is then disconnected until an other car approaches.

Where it is necessary to register th time of cars at a distant point, anothe operator is stationed at that point wit another key, which is electrically con nected with the recording instrumen He is connected also with the first opera tor by telephone through the same wir As a car approaches the second operato he calls its number to the first, who re peats it to be written down. Then h closes the key and the car striking th wire makes the registration, which is als called off and noted.

The recording instrument is in the cen ter of the picture, and the pen is plain shown, tracing a line on the paper tha covers the drum. The chronometer con trols the mechanism that drives the re cording instrument and keeps the pe synchronized with it. Any error in th

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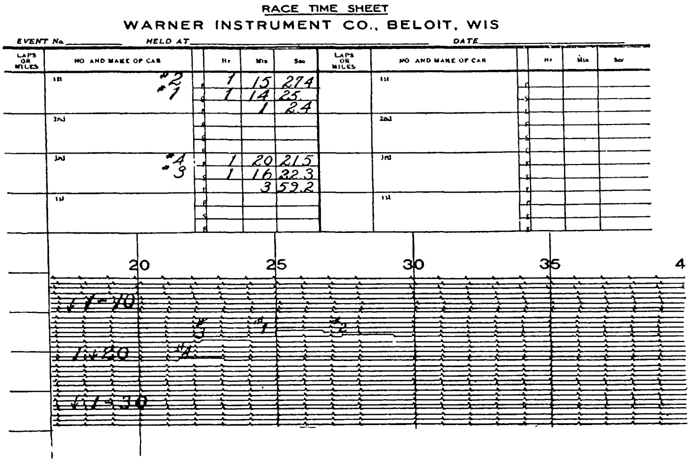


RACE TIME SHEET

WARNER INSTRUMENT CO., BELOIT, WIS

EVENT No.______ HELD AT________________ DATE__________

LAPS OR MILES	NO. AND MAKE OF CAR		Hr	Min	Sec	LAPS OR MILES	NO. AND MAKE OF CAR		Hr	Min	Sec
	1st #2	f	1	15	27.4		1st	f			
	#1	s	1	14	25			s			
		e		1	2.4			e			
	2nd	f					2nd	f			
		s						s			
		e						e			
	3rd #4	f	1	20	21.5		3rd	f			
	#3	s	1	16	22.3			s			
		e		3	59.2			e			
	1st	f					1st	f			
		s						s			
		e						e			

20
25
30
35
4
1-10
3
1
2
1-20
2
1-30
4

Referring to the cut that shows the Race Time Sheet and part of a record sheet, embracing the portion from twenty to thirty-five seconds, the time of each wide space is marked on the record sheet. On the fourth line below the ten-minutes-past-one space, just as the pen reached the twenty-five-second line, the first car passed and left its record. This car came around again a little more than a minute later and left its record on the next line, at the point marked No. 2. It started therefore at 1.14.25, and passed on the second lap at 1.15.27.4. The tenths are read by means of a small scale made for the purpose, by which the distance can be measured from the nearest notch.

Record No. 3 appears on the sixth line below the ten-minutes-past-one space, and just after the twenty-second second. By measuring its exact distance from that notch the time is ascertained to be 1.16.22.3. Record No. 4 appears on the tenth line, just after the twenty-first second, and the time is given as 1.20.21.5. This is all summarized on the Race Time Sheet. Spaces are provided for the finish, starting and elapsed time for each lap or mile for each car.

N. A. A. M. EXECUTIVE COMMITTEE MEETING

At the regular monthly meeting of the executive committee of the National Assocation of Automobile Manufacturers, Inc., held at the association's office on the 6th of October, the membership of the Electric Vehicle Company was transferred to the Columbia Motor Car Co., and the membership of the Royal Motor Car Co. was transferred to the Royal Tourist Motor Company.

Frank Briscoe, representing the Brush Runabout Co.; W. C. Johnson, representing the Waverly Co.; W. H. Van Devoort, representing the Moline Automobile Co.; R. H. Salmons, representing the Selden Motor Vehicle Co., and W. S. Austin, representing the Austin Automobile Co., were elected to membership.

The report of the show committee showed that 104 automobile manufacturers, the largest number on record, had applied for space at the Chicago show, and that still others had been received since the date of closing.

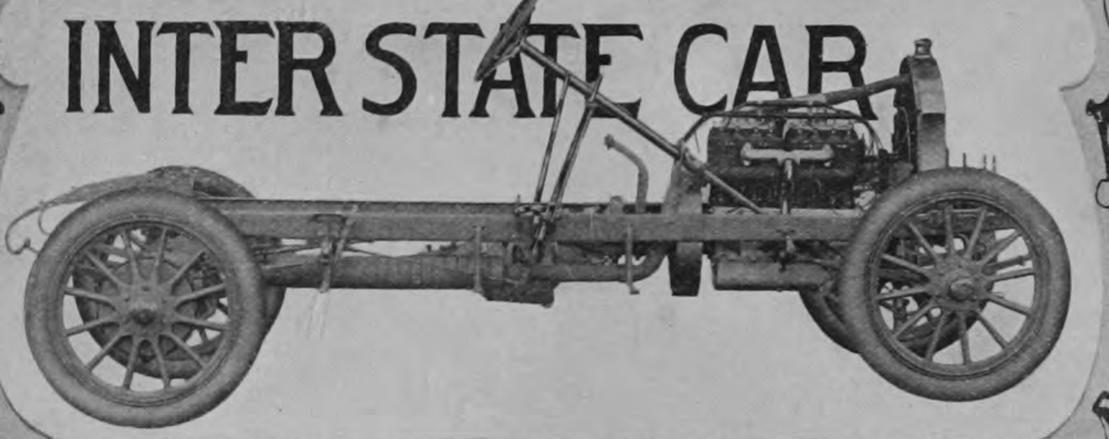
The question of the advisability of amending the Standard Warranty was referred to a special committee, consisting of Messrs. Kittridge, Innis and Clifton.

The committee decided to actively support the promotion of a convention to be held in Washington, either in December or January, designed to promote the interests of the National Registration bill now before Congress. This matter is in the hands of the Legislative Committee and of Charles Thaddeus Terry, the association's counsel.

The Paige-Detroit Motor Car Company is the name of a new concern recently organized and incorporated in Detroit, Mich., with a capital stock of $100,000. The old Stearns laboratory building on Twenty-first street has been leased and the necessary equipment is being installed. A three-cylinder, two-cycle runabout to sell for $800 will be ready for the market by December 1. The officers of the new concern are: Frederick O. Paige, president and general manager; Willis Buhl, vice president; Wm. B. Cady, secretary, and Gilbert W. Lee, treasurer.

The International Eng. Co., of 1779 Broadway, New York City, are now the sole and exclusive agents for the sale of R B F ball bearings, manufactured by the Societe Francaise des Roulements a Billes.

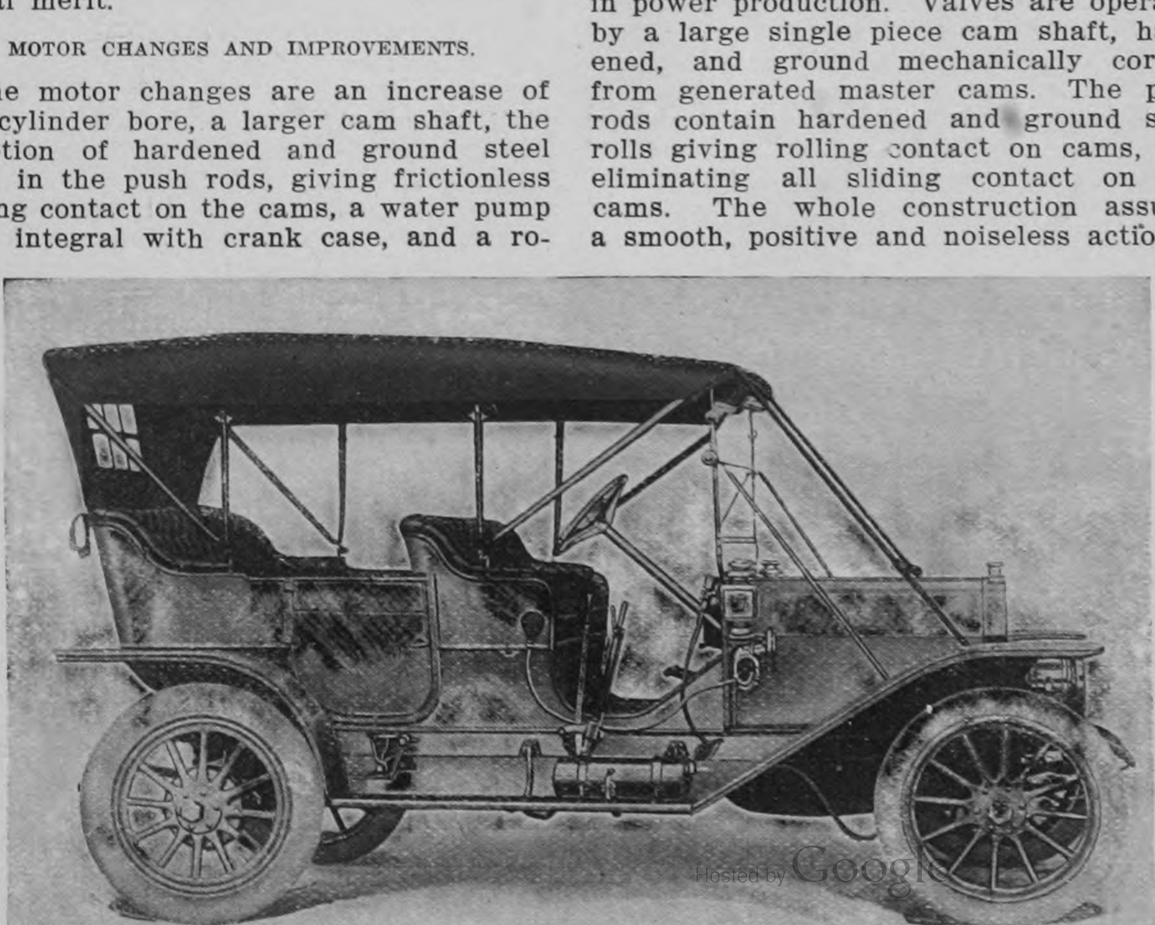
INTER STATE CAR



All the most important features of the 1909 Inter-State Models made by the Inter-State Automobile Company, of Muncie, Ind., have been retained in the 1910 Models. With the necessary refinements of detail added to an increased wheel base and larger cylinder bore, an improved type of clutch, a three-quarter elliptic rear spring suspension and more room in all styles of bodies. Nothing has been omitted which it was believed could give better results as to reliable running qualities, graceful appearance and economical up keep, all features which have been accepted universally as possessing exceptional merit.

MOTOR CHANGES AND IMPROVEMENTS.

The motor changes are an increase of the cylinder bore, a larger cam shaft, the adoption of hardened and ground steel rolls in the push rods, giving frictionless rolling contact on the cams, a water pump case integral with crank case, and a rotary gear oil pump on the outside of th crank case. The four vertical cylinder with integral water jackets and cast i pairs are given a high hydraulic test bot before and after machining to discove any unseen sand spots or flaws. Th bores are ground to exact dimensions a well as the pistons and rings and th latter are ground on the sides, assurin interchangeability. All are made of th finest gray iron. All of the valves ar located on one side with hardened an ground nickel steel heads and groun stems, and both valves and passages ar of large diameter, giving a high efficienc in power production. Valves are operate by a large single piece cam shaft, hardened, and ground mechanically correc from generated master cams. The pus rods contain hardened and ground stee rolls giving rolling contact on cams, an eliminating all sliding contact on th cams. The whole construction assure a smooth, positive and noiseless action.



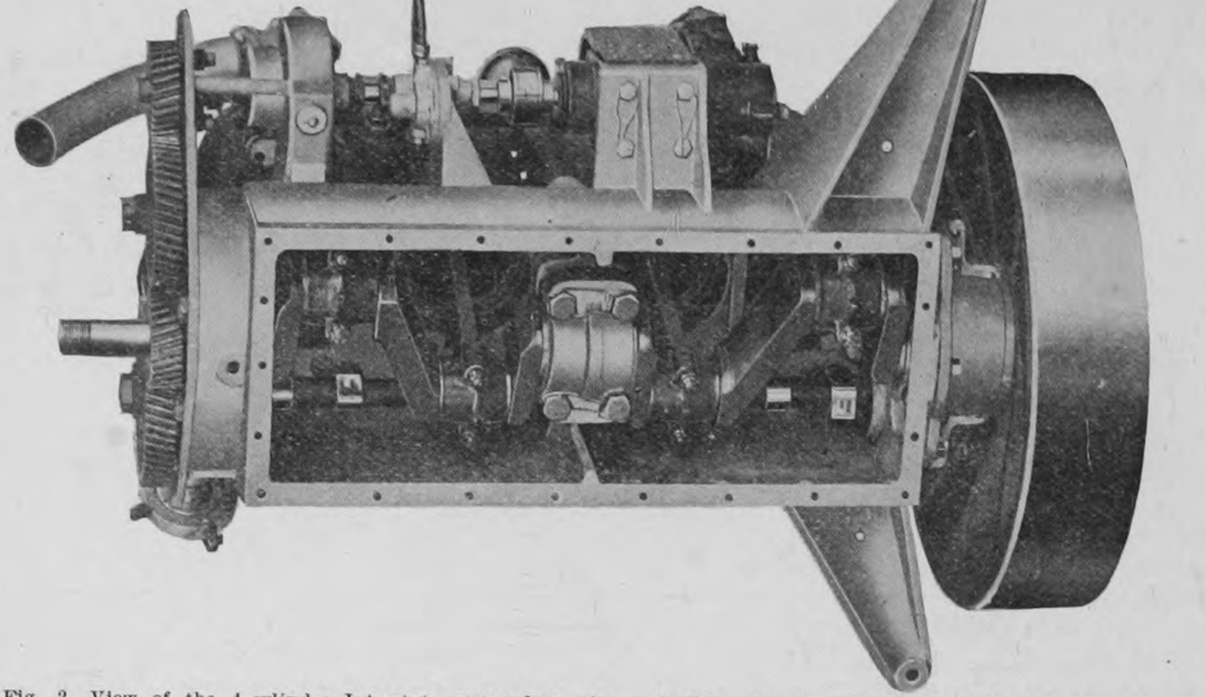


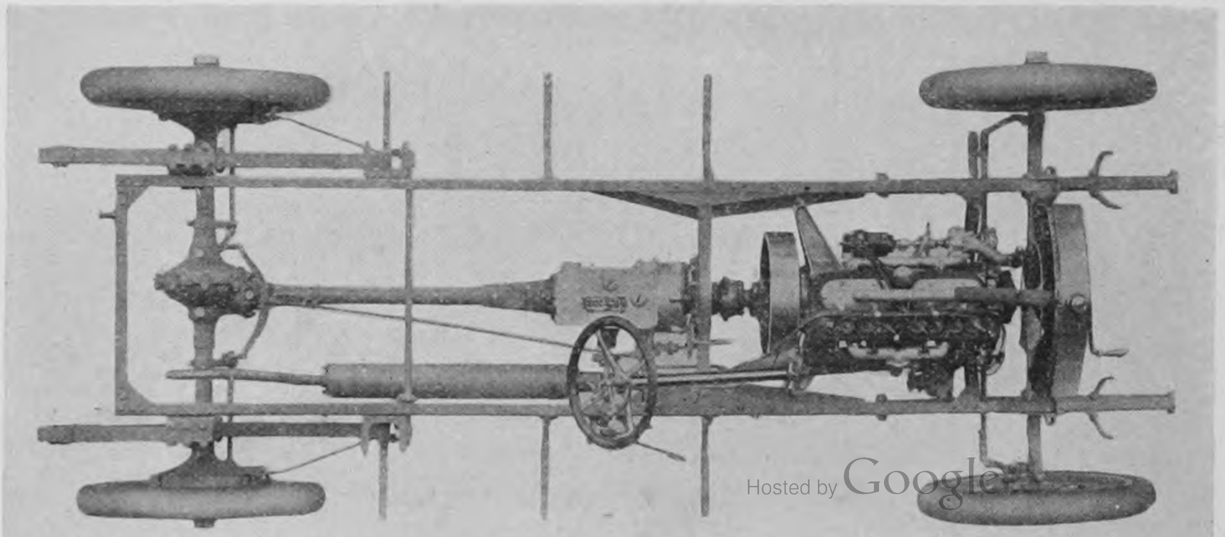
Fig. 2. View of the 4-cylinder Interstate motor from the underside, showing the lower half of the crank case removed. This illustrates the accessibility of the connecting rod and main bearings. Attention is called to the careful locking of all nuts and bolts and to the spiral quiet running gears at the forward end of the case. The cylinder bore has been increased to 4½ inches, cam shaft is larger than last year and hardened and ground steel rolls are now fitted to the bush rod ends. Cylinders arecast in pairs and the motor is mounted on a three point suspension. All cylinders are hydraulically tested for porosity or leaks.

The crank shaft is made for a special carbon steel forging, double heat treated, and all bearing surfaces are ground to exact size. It is supported by three large main bearings, the center bearing support being integral with the crank case and the rear and center bearings are adjustable for any possible wear. All bearings are of high-grade bearing metal, which in connection with the efficient lubricating system, assures long life under severe conditions.

LUBRICATION.

The crank case is a high-grade aluminum casting, accurately machined by the use of various jigs, and the oil reservoir is bolted directly to the bottom of it. This is easily removed for adjustment or inspection of the cam shaft, crank shaft, connecting rods or push pin rollers, and gives unusual accessibility, yet gives a very rigid crank case. The lubrication is accomplished by the constant level splash system with a sight feed indicator of latest type on the dash, indicating the flow of oil at all times from the reservoir to the crank case. The constant level is maintained by a rotary gear oil pump located on the side of crank case and driven by the water pump shaft. The oil reservoir holds two gallons and receives the return from the crank case by gravity.

Motor cooling is effected by a fan cooled radiator of latest type and a fan fly



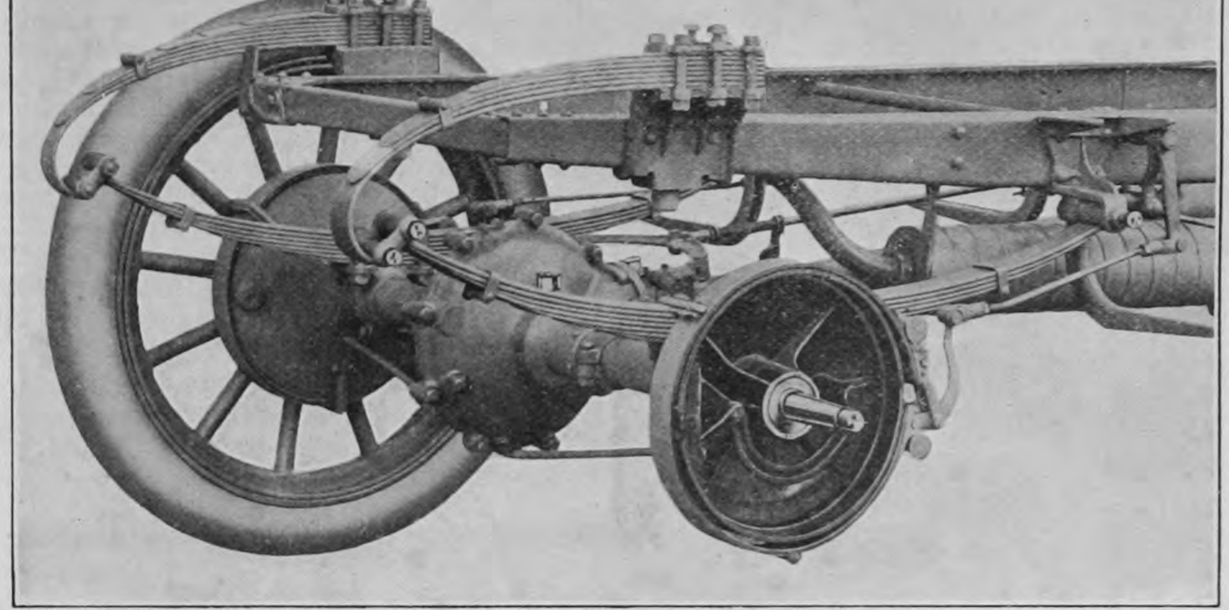


Fig. 4. Rear of the Interstate chassis showing one wheel removed. The rear springs as shown are of the three-quarter elliptic type with scroll ends and are fastened to the frame by means of special brackets which carry a rubber bumper on the under side.

heel. A positive system of water circulation is maintained by a gear driven cen-rifugal pump, the case of which is in-egral with the crank case. Radiator ooling is by a ball bearing fan supported rom the motor and driven by a flat belt rom the crank shaft.

MAGNETO AND BATTERY IGNITION.

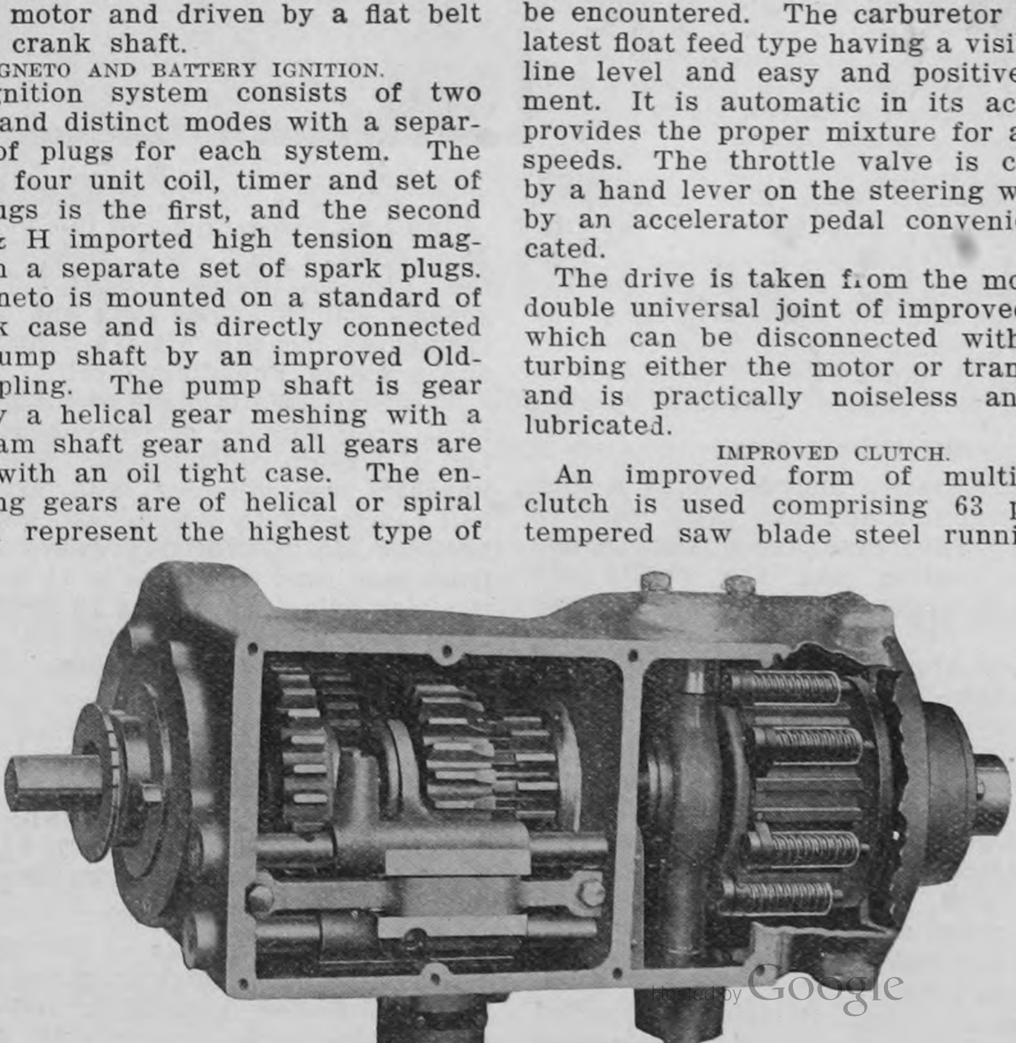
The ignition system consists of two eparate and distinct modes with a separ-te set of plugs for each system. The atteries, four unit coil, timer and set of park plugs is the first, and the second a U & H imported high tension magneto with a separate set of spark plugs. he magneto is mounted on a standard of he crank case and is directly connected the pump shaft by an improved Old-am coupling. The pump shaft is gear riven by a helical gear meshing with a elical cam shaft gear and all gears are overed with an oil tight case. The en-ire timing gears are of helical or spiral ype and represent the highest type of high speed gearing known, where smooth and noiseless action is required.

The gasoline fuel is supplied by gravity from a tank of large capacity and assures sufficient pressure on any grade likely to be encountered. The carburetor is of the latest float feed type having a visible gasoline level and easy and positive adjustment. It is automatic in its action and provides the proper mixture for all motor speeds. The throttle valve is controlled by a hand lever on the steering wheel and by an accelerator pedal conveniently located.

The drive is taken from the motor by a double universal joint of improved design, which can be disconnected without disturbing either the motor or transmission and is practically noiseless and easily lubricated.

IMPROVED CLUTCH.

An improved form of multiple disc clutch is used comprising 63 plates of tempered saw blade steel running in a



ive action as from the use of bronze and et has not the fast wearing features of he bronze discs. A ball thrust bearing etween the yoke collar and the clutch hrowout-yoke-ring eliminates a large mount of friction and consequent wear. he clutch complete gives a smooth positive action at all times and the qualities described assure long life. Six spiral springs evenly spaced outside of the discs, force the plates into intimate contact, giving a very even thrust on the clutch discs and not depending upon the action of a single spring. This construction makes it impossible for the clutch to fail owing to a single weakened spring.

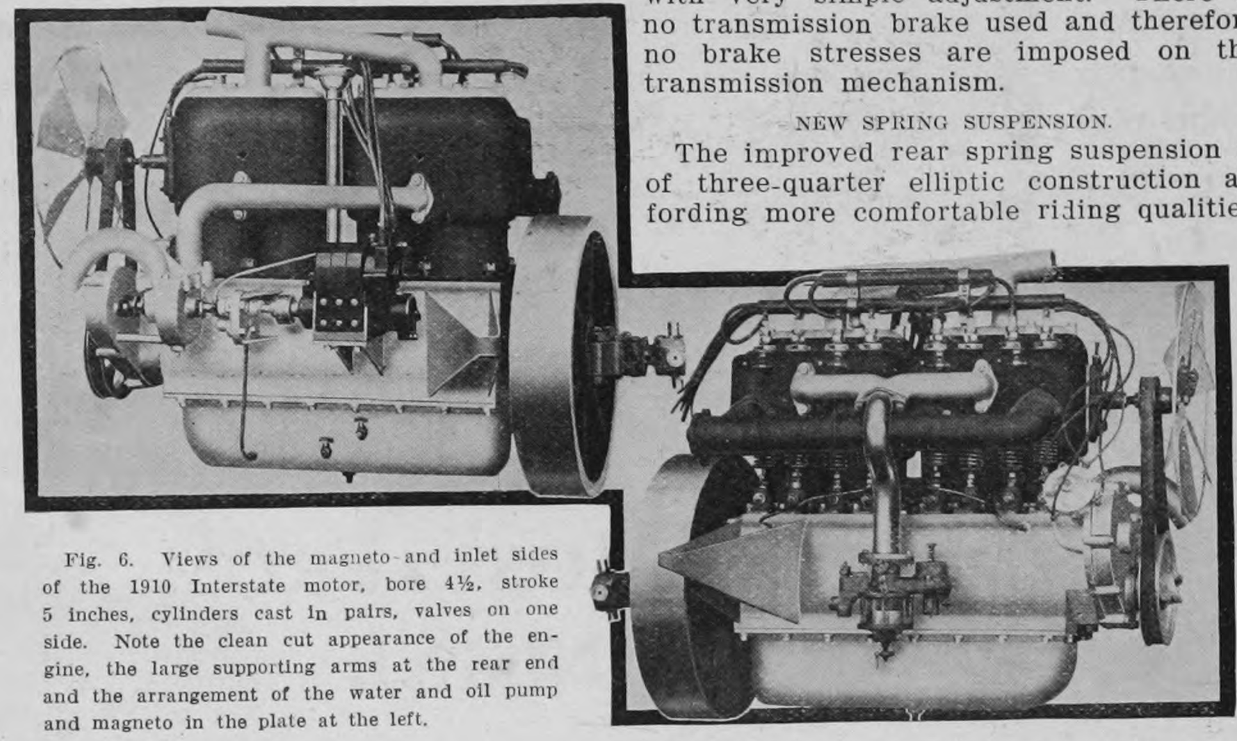


Fig. 6. Views of the magneto and inlet sides of the 1910 Interstate motor, bore 4½, stroke 5 inches, cylinders cast in pairs, valves on one side. Note the clean cut appearance of the engine, the large supporting arms at the rear end and the arrangement of the water and oil pump and magneto in the plate at the left.

THE CHANGE GEARS.

The Inter-State transmission is a durable construction and has great ease of operation. The case is a high grade aluminum casting and the shafts are supported throughout on imported annular bearings.

All gears are of extra wide face and heavy pitch—five pitch being used throughout—and all gears not in constant mesh are made of Vanadium steel. The sliding gears shift on the four keyed type of shaft and the keys are integral with the shaft. All gears are hardened and ground, and chamfered with the most improved form of curve. A double locking device holds the gears and shifting lever in position and prevents going by neutral position unintentionally.

The propeller shaft is rigidly supported

dimensions, and made of very carefully selected steel. The rear axle is equipped with the latest type of internal and external brakes. The two internal expanding brakes are used as service brakes. These are operated by pedals and are dust proof. All brake bands are lined with 2-inch Thermoid and are provided with very simple adjustment. There is no transmission brake used and therefore no brake stresses are imposed on the transmission mechanism.

NEW SPRING SUSPENSION.

The improved rear spring suspension is of three-quarter elliptic construction affording more comfortable riding qualities. They are very rigidly suspended outsid of the frame side rails and the wide spring base gives a more easy riding action o the car on rough roads. The rea springs are 45 inches long and the fron springs 42 inches. All are 2 inches wid and made of Vanadium steel.

The front axle is made of a high carbo steel drop forging properly heat treate and of I beam construction. The steerin knuckles are provided with extra larg ball bearings fully ground and eleven con nections are fitted with grease cups. Th front axle road clearance is 11 inches an the rear axle clearance is 10 inches. Th steel mud apron under the motor has road clearance of 11 inches. The 191 price is $1750.

The 1910 Philadelphia Show of the Au tomobile Trade Association will be hel during the week of January 17, in th Second Regiment Armory, Broad an Susquehanna avenue.

Chauffeurs Organize — Chauffeurs o Washington, D. C., have organized a Chau feurs' Protective Association and affiliate

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POWER

The whole world is demanding just that — **POWER.**

Just as the material rewards of the business world go to the man who has in him that nameless something that men call power, so, too, the awards of the automobile world go to that car which has beneath its bonnet the same wonder-working thing.

Only—in the motor's sphere that something is no longer nameless—it is called

PERFECT IGNITION

It is not enough that you have an ignition system which never fails—though heaven knows that is important enough—but you must also have a system which

GETS THE MOST FROM YOUR ENGINE

That's all there is to it—just get the most out of your engine and to do that

THE SPARK MUST BE HOT

And a **HOT** spark means Magneto Ignition. Batteries, even when new, are but a makeshift. And when they are old—you know, you who have had them on your car. Yet a **GOOD** battery is better than a **POOR MAGNETO**; for a generating unit which is not dependable is worse than useless.

A dependable hot spark—even that's not enough the spark must occur in each cylinder at exactly the right time; it must be synchronized.

The following pages will show how and why the

K-W Magneto Is Best

Dependability
Hot Spark
Synchronism

THE K-W IGNITION COMPANY

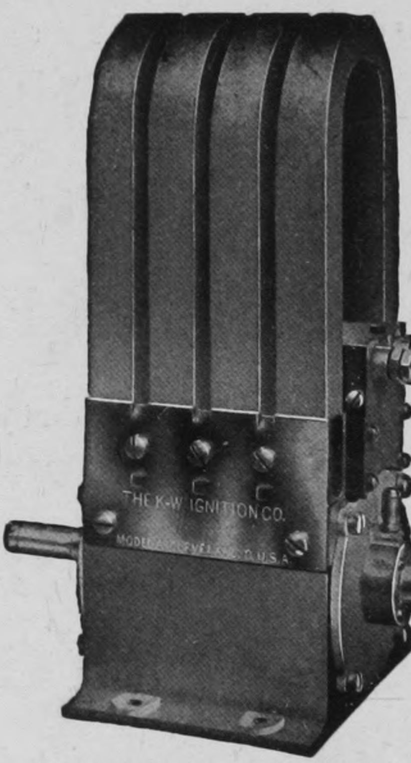
40 Power Ave., Cleveland, Ohio, U. S. A.

N. Y. Agency: 1686 Broadway, New York.
N. E. Agency: 70 Long Wharf, Boston, Mass.
Chicago Agency: The Automobile Supply Co., 1339 Michigan Ave., Chicago, Ill.
Philadelphia Agency: Jas. L. Gibney & Bro., 215-217 North Broad Street.
For sale by the Canadian General Electric Co., Toronto, Canada.

SIMPLICITY

THE K-W MAGNETO

Has only one moving part—could anything be simpler than that? Just a revolving armature, mounted on ball bearings; that is all there is to it—no moving wires—no brushes—no triggers—no anything that can get out of order. The K-W has **FEWER PARTS** than any other Magneto made; that means



Model AL for Jump Spark

DURABILITY

The fact that our design and workmanship are the best, and our Magneto the most powerful, is the reason that we get a really

HOT SPARK

The fact that the spark from a K-W Magneto is so much hotter than that from any other source of current is the reason that you can **START YOUR ENGINE** on the Magneto every time as easily as on **good** batteries. And it is also the reason that your engine will **RUN WITHOUT MISSING** and will develop 20 to 30 per cent. **MORE POWER.**

The K-W Magneto will run your

ELECTRIC HEADLIGHTS

perfectly and give you **more** light, and **cheaper** light, and **less bothersome** light th a gas tank—and it is the **ONLY** Magneto that will do it and at the same time furnish t hottest and best spark for your engine. No other Magneto is powerful enough to do th

In order to get absolute

SYNCHRONISM

you will want a

K-W MASTER VIBRATOR

Used in connection with your old coil and a K-W Magneto this device will wonderfu improve the running of your engine, besides freeing you from the nuisance of vibrators stic ing, pitting and burning off. It is greatly to be preferred to even the **BEST** distributor syst and is at once cheaper and easier to install, since its price is only $15.00. But no amou of money can buy a better device—nor even as good a one.

THE K-W IGNITION COMPAN

40 Power Ave., Cleveland, Ohio, U. S. A.

WATER
IS A FINE DRINK

—But not for SPARK COILS.

t is just that tablespoonful of water that is found in **ALL** other spark coils that causes their windings to break down after a certain amount of use. We, and we only, go to the expense of naking **ABSOLUTELY SURE** that our coils contain no moisture whatever.

The
K-W COIL

Does Not Contain a Single Particle of Moisture

AND HERE IS WHY

Four-Cylinder Coil and Switch. Price, $30.00
Other prices on application

The windings for a K-W Coil are placed on end in an bsolutely air-tight steel vat. This vat is steam-jacketed and is eated to 250 degrees.

Now water boils at 212 degrees, so you can imagine what appens in that vat. After **six hours** of this heat we suck out every **PARTICLE OF WATER** and every bit of air and other gas.

The windings are now 10 per cent. lighter than before reatment and are so dry that the most careful scientific analysis ails to show even a trace of moisture.

Next the **PERFECTLY DRY** molten dielectric, or insulating, solution is forced into the coils under a pressure of 125 ounds to the square inch. We keep up this pressure for **three hours** more and by that me every remote part of each winding is perfectly impregnated and no electric strain can ossibly break them down.

Nothing short of a sledge can hurt them.

Other things being equal, this one item of being absolutely anhydrous would alone make ne K-W Coil rank first; but we are not satisfied with that—we want a coil that is **BEST T EVERY POINT.**

So we use a special Platino-iridium alloy that is worth **twice its weight in gold.**

Then, too, our vibrator is three to four times as fast as other makes. All of which neans a hotter spark on **LESS CURRENT,** and longer life.

WHEN YOU USE THE BEST MAGNETO—
OU SHOULD USE THE BEST COIL, THE K-W

THE K-W IGNITION COMPANY

K
W

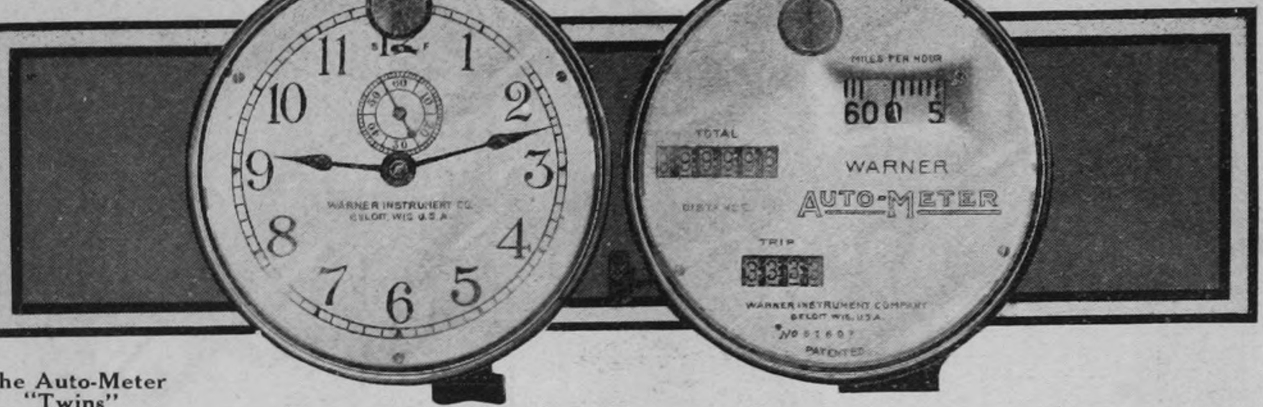
IT WOULD
BORDER
ON THE ABSURD

to suppose
that you haven't
SEEN
the three preceding
pages—but you should
READ
them—they tell of

K-W Coils
Magnetos
Master Vibrators

THE K-W IGNITION COMPANY
40 POWER AVENUE, CLEVELAND, OHIO, U. S. A.

N. Y. Agency: 1686 Broadway, New York. Chicago Agency: The Automobile Supply Co
N. E. Agency: 70 Long Wharf, Boston, Mass. 1339 Michigan Ave., Chicago, Ill.
Philadelphia Agency: Jas. L. Gibney & Bro., 215-217 North Broad Street.
For Sale by the Canadian General Electric Company, Toronto, Canada.



he Auto-Meter
"Twins"

1910 Models Now Ready

Auto-Meters purchased since September 1st, embody all 1910 improvements. These are entirely in the way of minor refinements. No other changes could be made. It is difficult to improve **perfection**.

"The Twins" shown above are the latest addition to the Auto-Meter family. They make a particularly pleasing appearance on the dash. Both dials are illumined by hooded electric bulb under the glass. There are no reflections and no outside rays to disturb the vision. The eight-day clock winds by a special device. No key is needed. You should see this new creation.

The Warner Auto-Meter

Guaranteed Absolutely Accurate

s made on the magnetic principle which alone s suited for speed indication. It indicates corectly every range of speed from zero to the xtreme. Centrifugal instruments give no inlication whatever under 5 to 10 miles per hour.

The Auto-Meter has only two moving parts. These revolve. The bearings are sapphire ewels and imported steel balls. It is so solidly nd strongly made that it cannot break or get out of adjustment, and will correctly indicate peed and distance during the life of many cars.

Continued improvements and refinements during the years the Auto-Meter has been on the market have developed it into a perfect instrument. The mistakes which imitators are making were overcome in the Auto-Meter while still in its infancy.

We Invite Comparative Tests

Before you decide on any speed indicator, put the Auto-Meter on one side of your dash and any other indicator at any price on the other. Then use your watch over a measured course. Keep the instrument which tells the **truth**. We know which it will be.

The Warner Instrument Co. Main Offices and Factory: 650 Wheeler Avenue, **Beloit, Wis.**

BRANCH HOUSES

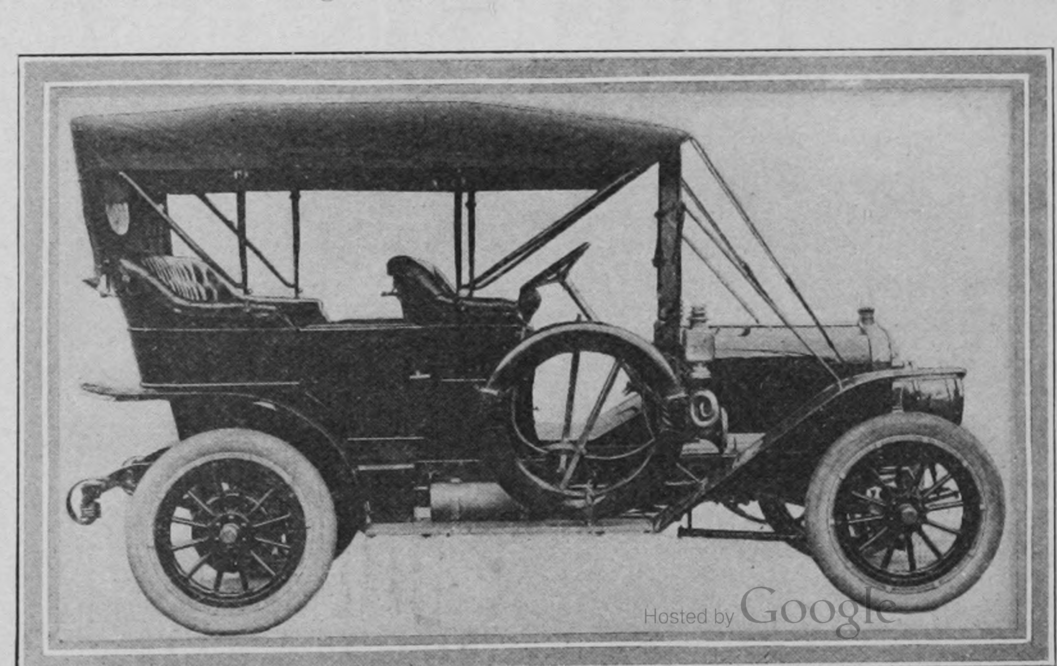
THE 1910 CORBIN

BY C. E. MORRIS.

In common with many other American manufacturers, The Corbin Motor Vehicle Corporation, of New Britain, will produce but one chassis in 1910, fitted with a 4-cylinder water cooled motor, though when desired, the well known air cooled motor may be had, each with a 4½-inch bore and 4¼-inch stroke. The Corbin engineers rather favor the greater bore than stroke type of engine. All Corbin types, excepting the enclosed cars, sell for $2,750, the latter demanding $3,750 and considering the nicety of Corbin workmanship and construction, this latter figure for a closed type of vehicle is very reasonable. The Corbin has long been designated as the "full jeweled" car for the reason that in its construction, the use of annular ball bearings is very general. That the Corbin has been a successful car goes without saying, and actual service has proven the equal in performance of many othe cars costing a much greater amount. likewise possesses features of up-to-da construction not found on many highe priced machines and the care in manufa ture, in selection of materials, the atte tion bestowed upon the little details, commendable and such as to make for reliable product under all service cond tions. The 1910 Full Jeweled Corbin pr sents few departures from previous Corbi practice, and, none of them at all radica In fact, such changes as do mark the 19 model, rather tend to give the purchase a little more for his money.

SOME CHANGES.

The front springs have been shortene the Bosch magneto which is now furnis ed as regular equipment, is relocated ar



ric oil pump has been substituted. This s driven by the same gear which actuates he vertical column distributor of the battery ignition system. The fan support is edesigned and fitted with a spring tenion device for the rope pulley drive. The ear driving axles are of vanadium steel.

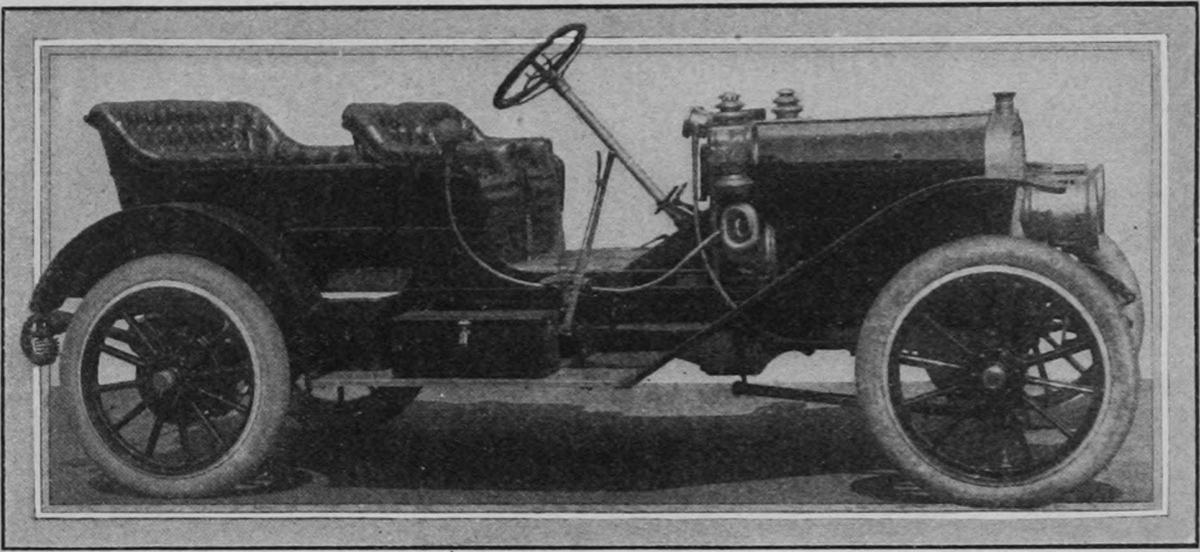


Fig. 2. 1910 Corbin car fitted with toy tonneau, specifications the same as in Fig. 1, seats comparatively low, plenty of foot room. Price $2,750. Enclosed models $3,750. Either water or air cooled motors can be had.

MOTOR.

The motor of the Full Jeweled Corbin, side from the relocation of the magneto nd new type oil pump, presents no hanges to speak of. The valve gear remains the same and the cylinders as in past models are single cast units making t possible to employ a five bearing crank shaft. All valves are of nickel steel and ocated on the left side of the motor looking forward and are actuated by a single heat treated cam shaft ⅞-inch in diameter. The cams are pinned and keyed. The cylinders are of selected gray iron bored and reamed. Each cylinder unit is secured to the upper crank case section of aluminum by four steel bolts, ½-inch stock, 11¼ inches long. The two forward cylinder bolts of the number one cylinder are of the same size stock but are 13 inches long, and, as do the other retaining members, pass through the lower case section as well as the upper. The forward bolts also serve as anchorages for the forward motor support. That is to say, they are secured to an I beam section steel cross member and form a strong point support for the forward part of the motor. All valves are covered by brass screw plugs in which are retained the spark plugs, there being one plug to each brass screw cap, since the ignition is double. The same form of valve mechan-

cast integral with the upper section of the crank case are anchored at one end and work between the cam and valve lifters. As the cams are brought into play, the yokes impart a direct vertical lift to the valve stems, which, by a lock nut device, are adjustable. The valve plunger guides are clamp bolt retained, there being one clamp to each pair. The valve springs are of special spiral steel. The Corbin method of valve construction makes for quiet valve action. The water pump is located midway between the front and rear pairs of cylinders and the construction is such that, by the removal or loosening of a castellated nut the entire pump assembly may be withdrawn with ease. The water pump is actuated by a train of gears driven off the cam shaft and provided with a spring drive device which obviates trouble in cold weather. In case the pump should become frozen, the breaking of the spring will prevent damage to the pump.

A unique feature of Corbin construction is the retention of the exhaust and inlet manifolds. Four steel clamp bolts retain both manifolds in place, making their removal a simple matter. All motor pistons are ground to size, and are of selected cast gray iron fitted with four gound eccentric rings. All valves are of special valve steel 1 7-16 inches in diameter and interchangeable. The pistons are ground to a taper, and vary in diameter from 4-1000 at the bottom to 6½-1000 at the top. There are four oil grooves, ¼-inch wide and 1-32-inch deep. The new type eccentric oil pump is driven off the cam shaft and located at the base of the vertical distributor column, one gear driving

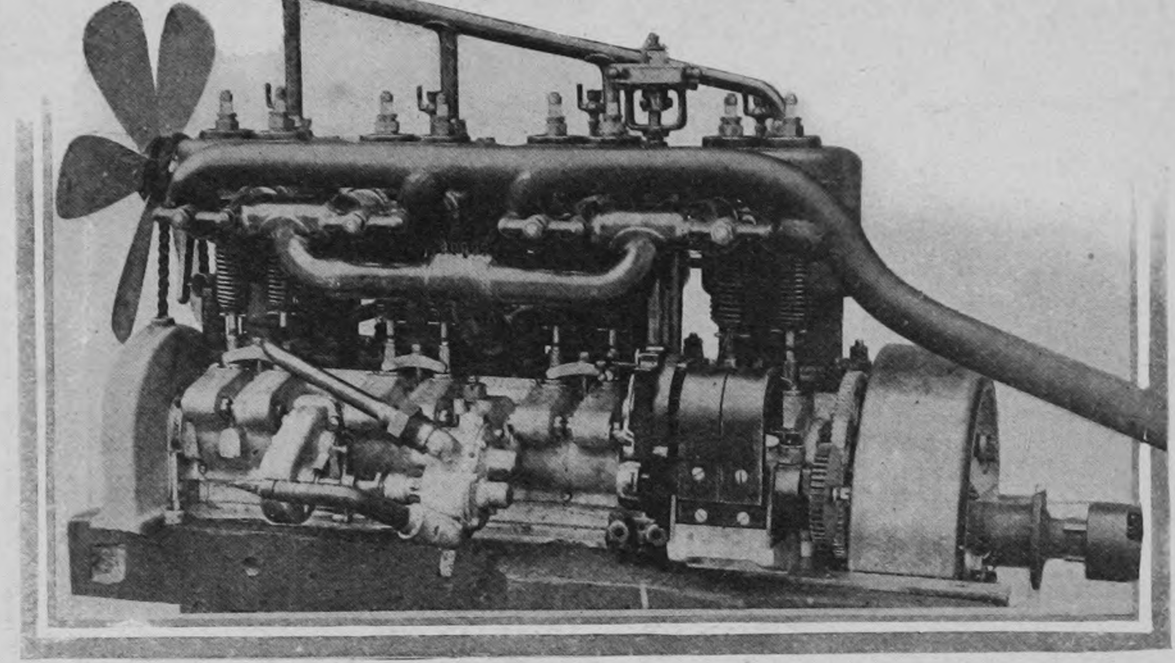
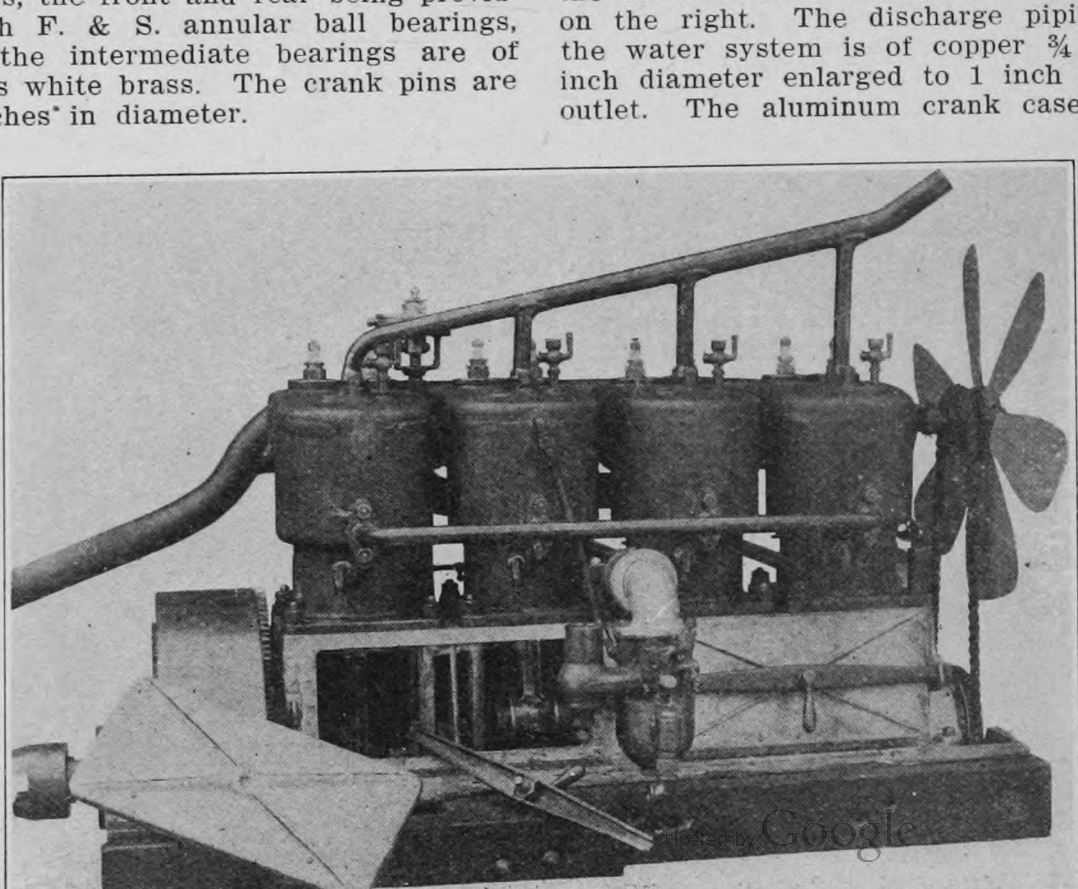


Fig. 3. Exhaust and inlet side of the Corbin 4-cylinder water cooled motor. Valves on one side, single cam shaft. The forward end of motor is supported by an I section steel cross frame member. This view shows the water pump driven by a train of gears through a spring drive device from the cam shaft; the entire pump assembly can be removed by loosening a couple of castellated nuts. Note the accessible position of the timer at the top of the engine.

section is secured to the crank pin by one large steel bolt and castellated nut. Adjustment of bearings is thus rendered a simple matter. Connecting rod bearings are of Parsons white brass. The crank shaft is of 45 point drop forged carbon steel, five bearings, the front and rear being provided with F. & S. annular ball bearings, while the intermediate bearings are of Parsons white brass. The crank pins are 1½ inches in diameter.

The inlet pipe is of copper and the exhaust of steel tubing, the water piping being copper also. The connection from the water pump is likewise of copper tubing and passes from the left side of the motor between the first and second cylinders to the inlet water manifold, of neat design on the right. The discharge piping for the water system is of copper ¾ of an inch diameter enlarged to 1 inch at the outlet. The aluminum crank case is in



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ler units to the upper section, a most simple form of construction. The motor pearings are carried in the lower case section and the removal of a cylinder unit loes not disturb the adjustment. Two arge hand holes on the left side of the notor permit of ready inspection of the vorking elements and all adjustments may be made through these openings. These hand hole covers are retained by large pressed steel yoke and a turn crew. Each cylinder is provided with a elief pet cock. The magneto is relocated n the 1910 Corbin being now carried on he left side and is driven by bronze and iber gears off the cam shaft, just forvard of the fly wheel. The carburetor is ocated on the right side, the manifold eing carried between the second and hird cylinders to the inlet ports on the eft, the Schebler carburetor used being vater jacketed, water being taken from he head of the number three cylinder vater jacket. The timing gears are carled in an aluminum housing. Cable uides are located on top of the inlet maniold.

The clutch is of the fly wheel cone type, ension and adjustment being provided by hree spiral steel springs, set in a trigle. The female member is of course rmed in the fly wheel, the male member eing of aluminum, four small steel strip rings are inserted in the face of the utch under the leather and provide a nooth engagement. A commendable feaure of Corbin construction is the clutch rake. In many cars, spinning of the utch after disengagement is a detriment operation of the car, especially when ne must bring the machine to a quick op. A steel strip brake carried on e clutch pedal bar acts directly gainst the outer edge of the clutch member as it is disengaged and the tension is fficient to check the revolution of the ember without inducing undue wear. he clutch pedal operates through a mulplied linkage, through a hole in the floor ard, not a slot as in common practice. he yoke or fork is provided with F. & S. nnular ball thrust bearings. The clutch ide joint is fitted with four integral keys, l end thrust is of course cared for by e ball thrusts. Not only is the motor chored forward on the I section transerse member, but it is also supported the steel under pan which this season of heavier dimensions.

Lubrication of the motor is by splash d force feed. The oil tank is carried der the foot boards and may be filled om the tank filler on the inside of the

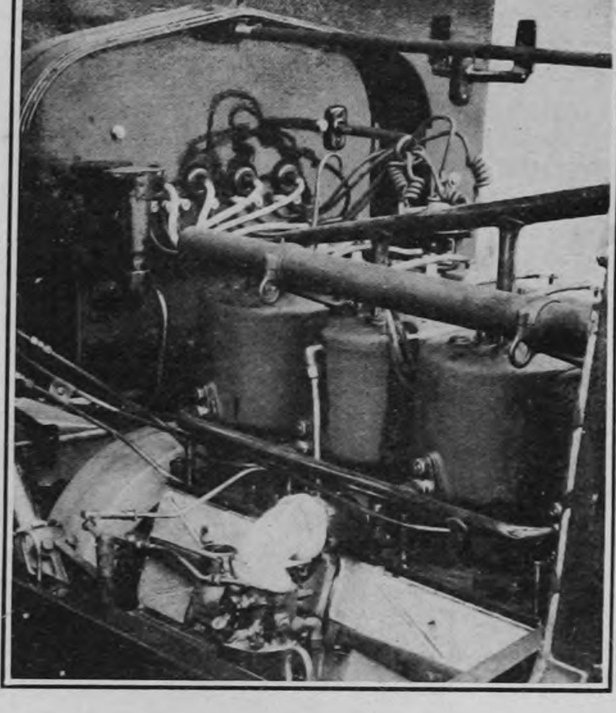

Fig. 5. A look under the bonnet of the 1910 "Full Jewel" Corbin which shows the engine in position and the arrangement of the wires passing through the dash.

pipes to the base of each cylinder where it is lifted by the pistons. The faces of the webs, and the pins of the crank shaft are drilled so that there is a circulation of oil to the face of the pins as well as the splash dip.

Cooling is by water, a large square tube radiator carrying the supply. The supply for the jackets which are of liberal capacity, is drawn from the bottom of the radiator passed through the pipe to the inlet manifold at the base of the jackets on the opposite side of the motor, the discharge taking place through the heads of the cylinders.

IGNITION.

Accepted practice of to-day favors the dual or double system of ignition, and actual service deems it a wise provision. The Bosch magneto, which is furnished as regular equipment for 1910. is used for the primary current supply. Disregarding general practice, the Corbin engineers have placed the magneto plugs of the high tension system over the exhaust valves. The reserve or battery plugs are carried over the inlet ports, the idea being to keep the plug points clean by the inrushing gas. The distributor of the battery system as previously mentioned is located at the top of a vertical pillar and driven from the cam shaft by the same gear that serves the oil pump. For the battery system a single unit Connecticut coil is carried on the fiber tube and then to the four plugs of the magneto set. The switch is located on the dash coil.

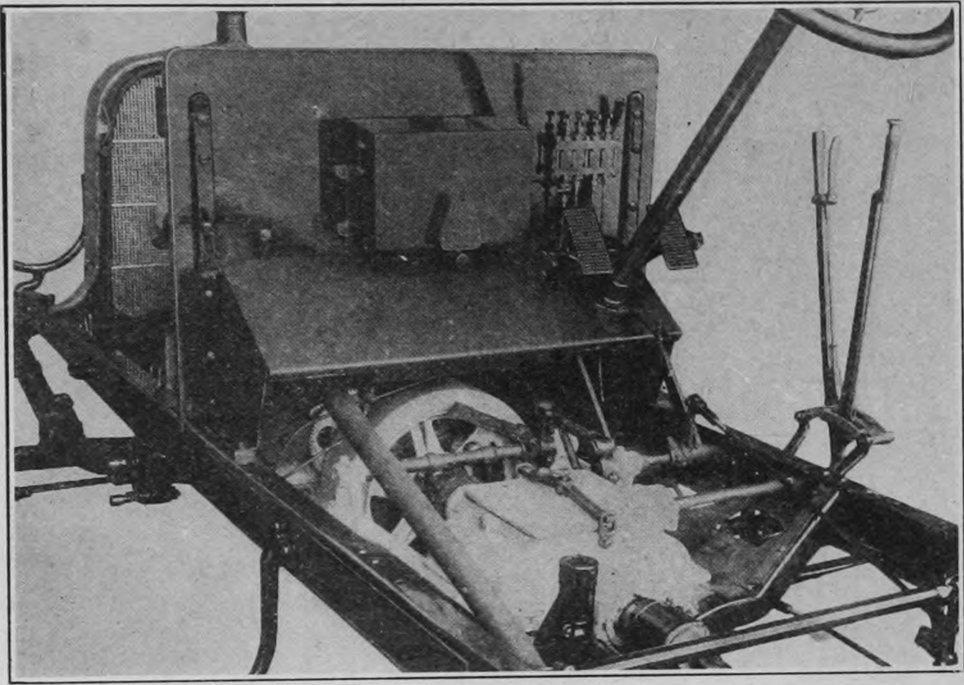

Fig. 6. Rear of the 1910 Corbin car dash showing the control pedals of liberal width and fitted with lipp
edges to prevent the feet from slipping. The accelerator pedal brake and gear shift levers are also clearly show
together with the sight feeds arranged on the dash. Attention is called to the method of holding the transmissi
case cover in such a way that it can be instantly removed, this being a Corbin feature. It will also be notic
that the pedals operate through holes in the floor board, not slots. A clutch brake is provided to facilitate ge
shifting.

THE CHANGE SPEED GEARS.

The transmission is of the selective type with sliding gears, having three forward speeds and one reverse, the crank case and transmission are on a three point suspension, and are secured to a transverse member of the frame. The crank case and transmission are bolted together, forming a single unit, the transmission being to the rear of the clutch assembly with the shifting rod just underneath the removable cover. The case, as usual, is of aluminum, in two sections. Lubrication is by splash. The gears are of special gear steel accurately machined, case hardened and ground, the shafts being supported on F. & S. annular type ball bearings. The final drive is by propeller shaft fitted with two Hartford universal joints to the semi-floating rear axle. The shafts are of special steel, heat treated, and mounted in annular ball bearings with special thrust bearing. The driving pinion is provided with three annular ball bearings and one thrust bearing. A tubular steel torsion tube is fitted, being anchored to the differential housing at the rear and carried in spring bumpers just to the rear of the transmission case. The forward end of the tube is fitted with a ball

well known I-beam type, drop forged,
one piece, without a weld and having
tegral spring seats and steering yokes,
steering assembly being carried to
rear of the axle. The forward spring se
are secured to the axle spring seats w
two heavy steel clip bolts. The forwa
ends of the front springs are secured
the frame ends while at the rear they
shackled to drop forged steel shackl

The front springs are semi-elliptic a
for 1910 have been shortened to 3
inches, perched midway between
spring eyes. All springs are of special
lected spring steel, the front memb
having five leaves, banded, graded and
ped, being 2 inches wide and 31½ inc
long. The rear sets are of scroll des
or triple action, having eight leaves
inches wide, graded, banded and lip
and are 50 inches long.

The steering gear is of the worm a
sector type, irreversible, the sector a
sector shaft being made in one compl
forging. mounted on bronze bearings.
asmuch as a complete gear is emplo
there is ample provision for take-up
wear.

The steering wheel is of wood, of la
dimensions, with spark and throttle lev
on a quadrant above the steering wh
spider. A foot accelerator pedal is c
veniently located to the right of the st

front and rear. Tires are 34x4 front and ear, any standard American make being urnished with the option of 3½-inch tires orward.

There are two sets of brakes working n the rear wheel drums. The foot brake ctuates the external contracting bands vhile the emergency lever works the in- ernal expanding bronze shoes. The lrums are of pressed steel and have a -inch face. Either brake is sufficiently owerful to bring the car to a quick stop.

The frame is of pressed steel, hot rivet- d, of heavier dimensions than heretofore nd herein is an added factor of safety. The side members are straight through- out their length. It is strongly trans- ersely braced. The side members are

heavier stock. The forward section of the chassis is rendered especially staunch by the steel under plates, which serve as supports for the motor. Either quick detachable or clincher rims are furnished as standard equipment which also includes, Bosch high tension magneto, mohair cape top, Prest-o-lite tank, full complement of lamps, tools, etc. The wheel base of the standard cars is 110 inches, an increase of 2½ inches over 1909. Tread is 56 inches. The wheel base of the limousine is 116 inches. The runabouts and toy tonneaus are geared 3¼ to 1, affording a speed of approximately 62 miles an hour, while the touring cars are geared 3½ to 1, affording a speed of 55 miles per hour.

The "Little Detroit"

Recognizing that there is an unprece- lented demand for a well built low priced Runabout, the Demotcar Co. which has een organized in Detroit with a capitali- ation of $100,000, has placed on the mar- et the little car shown in the accompany- ng illustration and known as the "Little Detroit." This machine, it is claimed, has ll the best features of the high priced ars yet is sold for $550 including the mag- eto. The distributors are the Demotcar Sales Co., 45 State Street, Detroit, Mich.

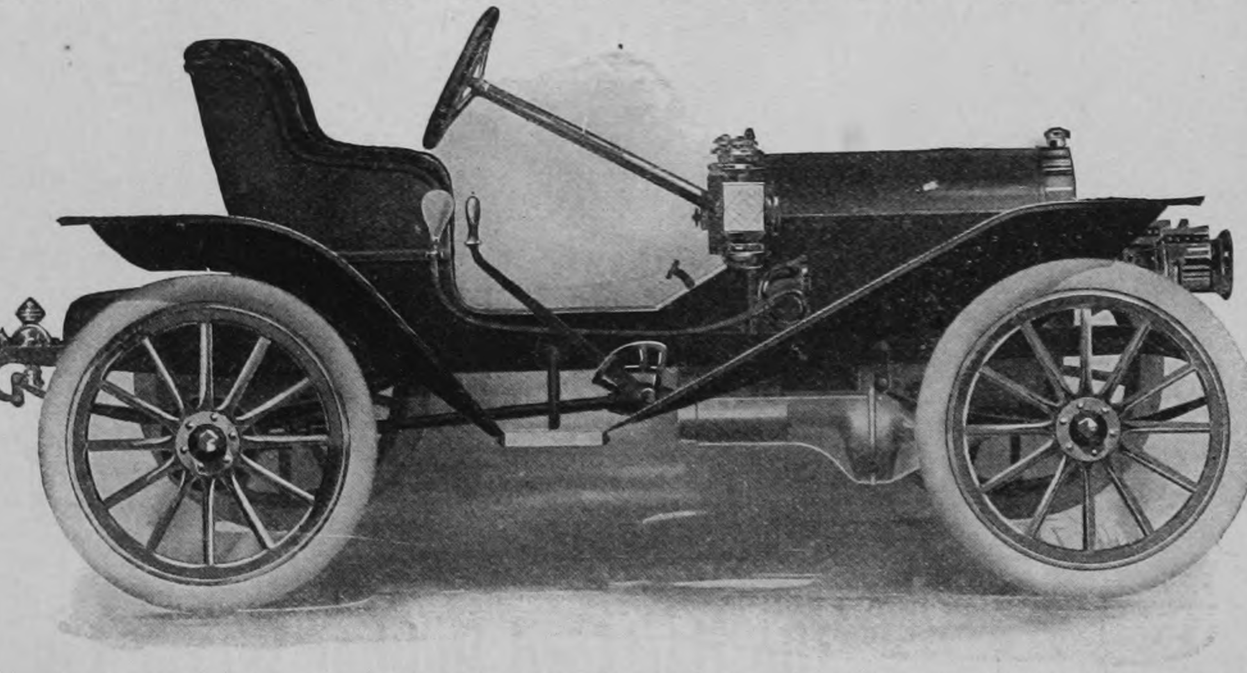

Fig. 1. The Little Detroit, a $550 car with a two-cylinder 6 H. P. engine, magneto ignition. Wheel base 76 inches, tread standard, planetary change speed gear, shaft drive, bevel gear rear axle. Equipment: two oil lamps, tail lamp, horn and magneto.

The "Little Detroit" has been designed o meet the wants of a mass of people vho desire an automobile but have been

The engine has two cylinders developing six horse power and is placed under the hood at the front. The power is transmitted to the rear wheels by a planetary change gear which gives two speeds ahead and a reverse. Control is by a single side lever and three pedals. A shaft fitted with a single universal joint and mounted on ball bearings transmits the power to the divided bevel gear driven rear axle which is mounted on ball bearings There are two internal expanding foot brakes which operate against drums in the rear hubs. The machine is comparatively low and rakish in appearance and has a wheel

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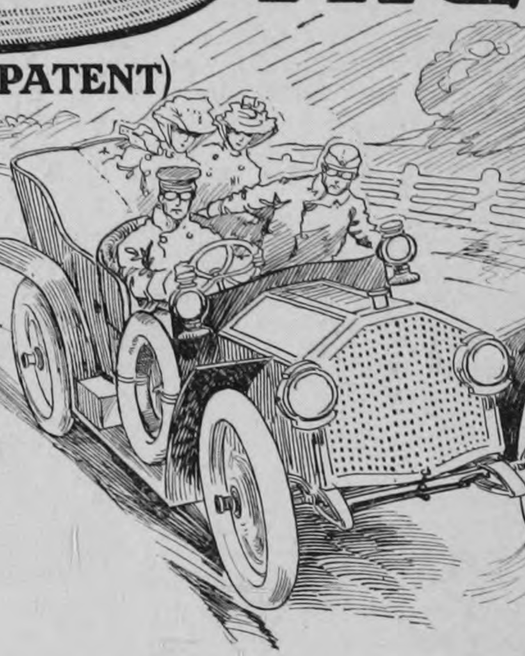
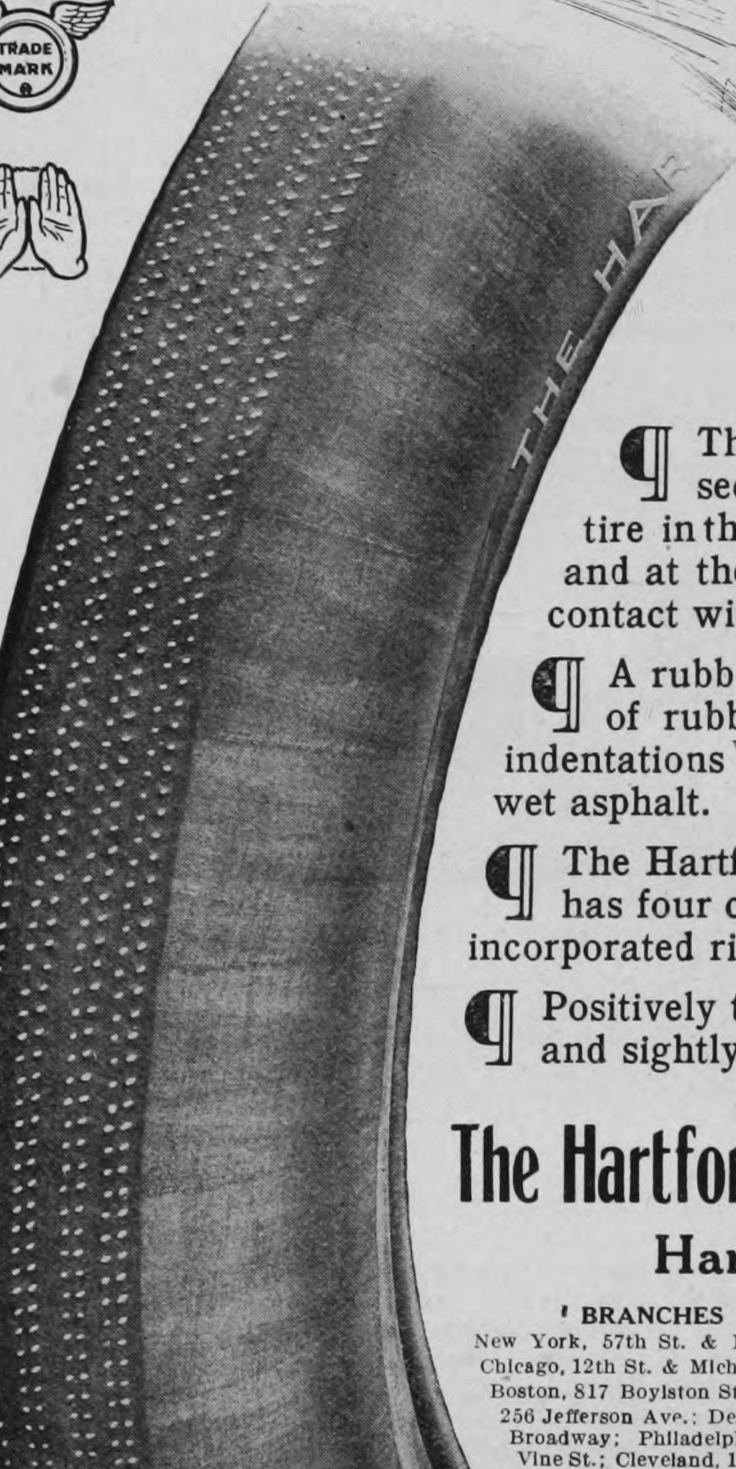
HARTFORD WIRE GRIP NON SKID TIRE

(MIDGLEY PATENT)

TRADE MARK





¶ The cut on the left shows a section of the greatest non-skid tire in the world, because it is resilient and at the same time metal comes into contact with the pavement.

¶ A rubber tire with any combination of rubber projections, corrugations, indentations or angles WILL SLIP on wet asphalt.

¶ The Hartford Wire Grip Non-Skid Tire has four coils of heavy steel piano wire incorporated right into the tread.

¶ Positively the only logical, safe, sound and sightly non-skid tire.

The Hartford Rubber Works Co.

Hartford, Conn.

BRANCHES

New York, 57th St. & Broadway; Chicago, 12th St. & Michigan Ave.; Boston, 817 Boylston St.; Detroit, 256 Jefferson Ave.; Denver, 1564 Broadway; Philadelphia, 1425 Vine St.; Cleveland, 1831 Euclid

AGENCIES

Pierson-Wilcox Electric Co., Minneapolis; Mercantile Lumber & Supply Co., Kansas City; Chanslor & Lyon Motor Supply Co., 930 S. Main St., Los Angeles, Cal.; 542 Golden Gate Ave., San Francisco, Cal.; 2001 Second Ave., Seattle, Wash.; F. P. Kernan Co., Portland, Ore.; Compania Mexi

piece construction giving an outline which harmonizes well with the rest of the car. This hood is 25 inches in length. The fenders are long and rakish with aprons to

equipment consists of two side oil lamp tail lamp, horn and magneto. A detaile description will be given later in thes columns.

Thomas Flyer—Model "M"—1910 Model

To anyone who has any doubts regarding the efficiency of the long-stroke motor a glance at the new 1910 Thomas Little Six, which is to be officially known as the Model "M", and a brief ride behind its wheel will be a convincing proof that the predicted possibilities stirred up by the "Four Inch Race" in Europe are not without just foundation.

Mr. E. R. Thomas, of the E. R. Thomas Motor Co., Buffalo, N. Y., recently returned from a five months' trip through Europe thoroughly convinced from his inspection of the foreign factories that the most important new feature for 1910 will be the long-stroke motor.

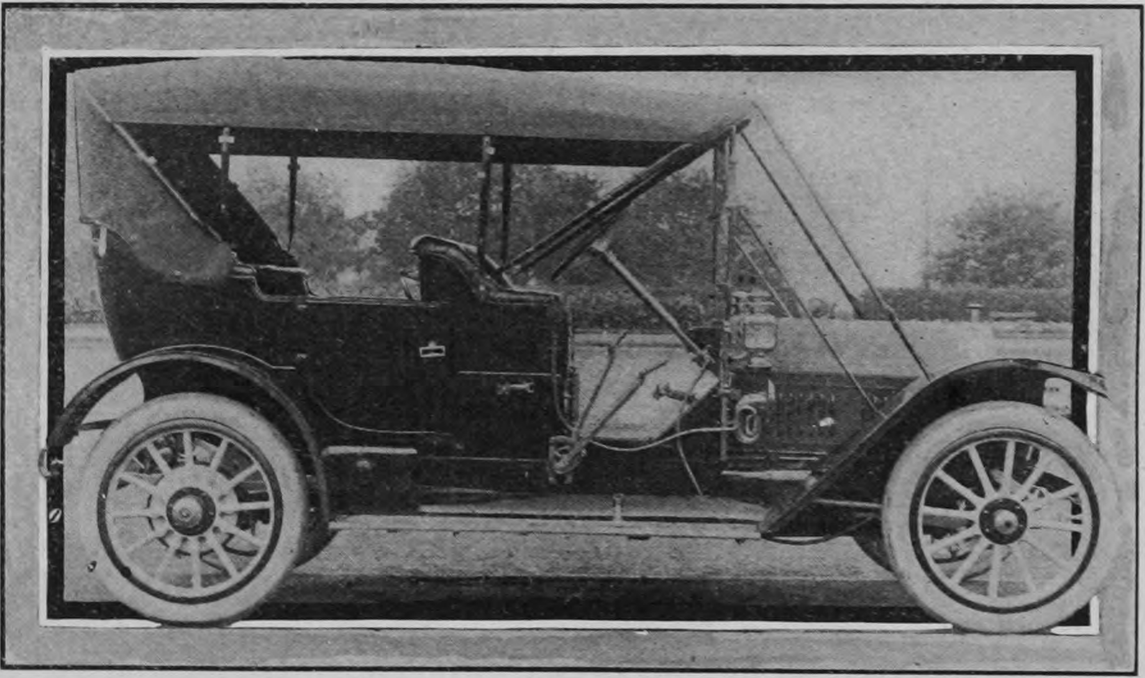


Fig. 1. 1910 Thomas Flyer Model M. This car represents the latest production of the Thomas plant. The motor is 6-cylinders, 4-cycle, water cooled, 4½ bore and 5½ stroke, cylinders cast in pairs; long pistons and large plain bearings, three disc clutch with cork inserts, sliding gear transmission, gears of nickel steel; Timken rear axle, shaft drive. Bosch magneto and Atwater-Kent Unisparker. Price, fully equipped, $3,500.

By the long stroke motor is meant one in which the travel of the piston is greater than the diameter of the cylinder.

The long-stroke motor does not have to revolve so fast to deliver its power, and will consequently wear longer.

For example, to drive a car 30 miles an hour, the Model "M" long-stroke motor makes 840 revolutions per minute, while a motor with 4-inch stroke, to give the same

are longer, the connecting rods are lon er and the crank case is much larger i diameter.

The liberal policy of the Thomas factor is shown by the fact that $3,500, the pu chase price for the factory's newest pro uct, known as the Model "M", includes a equipment, which it is claimed, is not e ceeded by any other high priced car o the market.

The equipment consists of top, glas front, speedometer, horn, headlights an Prest-o-lite tank, two oil side lights an tail lights, robe rail, two complete ign tion systems, the Bosch magneto and A water-Kent Unisparker and other mechan cal features not usually included.

This car is made with six types o bodies, including a touring car, runabou tourabout, flyabout, landaulet and limou ine. The open bodies are finished i Royal Blue with straw colored runnin gear, or Thomas Red with bright red ru ning gear; while the closed bodies a painted a dark maroon color and upho stered with French gray worsted.

THE MODEL M MOTOR.

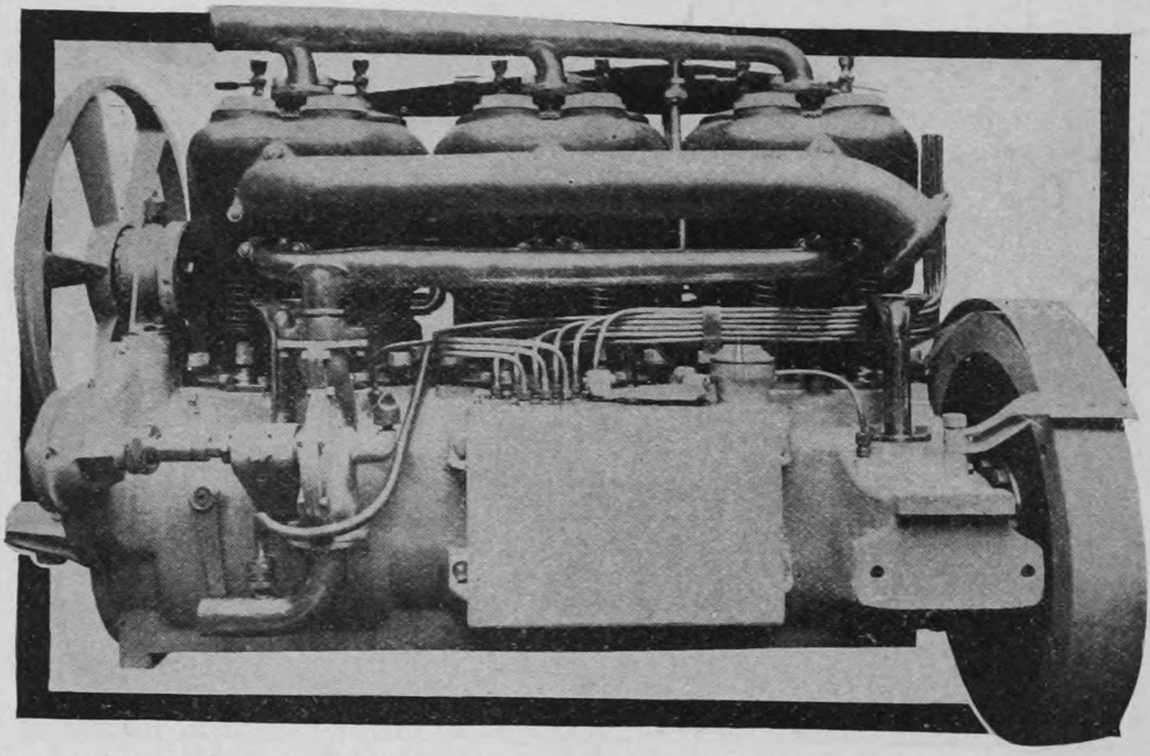


Fig. 2. Exhaust side of the Thomas Model M motor, cylinders 4½ by 5½, large valves completely water jack eted. This view shows the location, mounting and drive from the forward enclosed half time gears. of the wate pump. Tapered tubing with inlets to the three double water jackets is used. Note the neat arrangement of oi leads from the mechanical oiler, the fly wheel cover to prevent throwing the oil and at the centre of the fl wheel the pointer for assisting in correctly setting the valves.

The motor is a 6-cylinder, 4-cycle, water cooled type, with 4½-inch bore and 5½-inch stroke. The cylinders are cast in pairs and exceedingly well water jacketed. In the designing of the Model "M" motor, advantage has been taken of the very latest foreign practice regarding smooth gas passages and large valves. The actual diameter of the opening, in the clear, which carries the gas to the cylinders is 2⅛ inches, which is exactly half the diameter of the piston. The valve measures 2 5-16 inches across the head. In order to provide for continuous running without local overheating, the valves and stems have been completely water jacketed.

This complete water jacketing prevents deformation of either the valve seat or of the cylinder at the top of the bore. The necessity of large, smooth gas passages will be appreciated when it is stated that the gases travel through these passages at a rate of speed approximately three-quarters of a mile a minute.

The pistons are 5½ inches long and are provided with four narrow rings.

The connecting rod is made ¾ of an inch longer than the usual proportion of twice the stroke.

THE BEARINGS.

The bearings of the Model "M" have

The bearings on the cam shaft of sp cial bearing bronze, give support alm to the point where the cams themselv are attached. Each cam shaft has bea ings of 11.3 square inches projected are

Plain bearings are used throughout t motor.

Die cast bushing of a high grade babbitt are used on the crank shaft a on the big ends of the connecting rod.

These bushings are easily renewed an since they are made in dies, are absolut ly interchangeable.

MATERIALS.

The claim is made that all of the m terials used in the entire motor are of th very best that can be obtained. Th crank shaft is of a high grade of carbo steel and is heat-treated by a drop forg company which has made a specialty crank shaft manufacture for the past s years. The connecting rods are 3½ pe cent. nickel steel. Special piston ring iro is used for the rings. The cam shafts ar of nickel steel. The gears are of ste and phosphor-bronze and the connectin rod bolts are of nickel steel.

The fly wheel is not of cast iron, as usually the case, but of steel.

PHONENDOSCOPE TEST.

With the phonendoscope, a nice litt surgical device, the motor has been tho have been provided reduce the noise at the point of contact of the valve plunger with the valve stem. The valve stem clearance has been reduced about 50 per cent. by means of more accurate workmanship.

The necessity of balancing all rotating or reciprocating parts has been given careful attention. The pistons that enter the construction of any one motor are of the same weight. The crank shafts are also balanced, while, of course, the fly wheel receives the most careful attention. The compression space of each cylinder is also measured so that an engine is assembled with equal compression spaces in all the cylinders. Uniform compressions result in uniform explosions and the motor runs with less vibration.

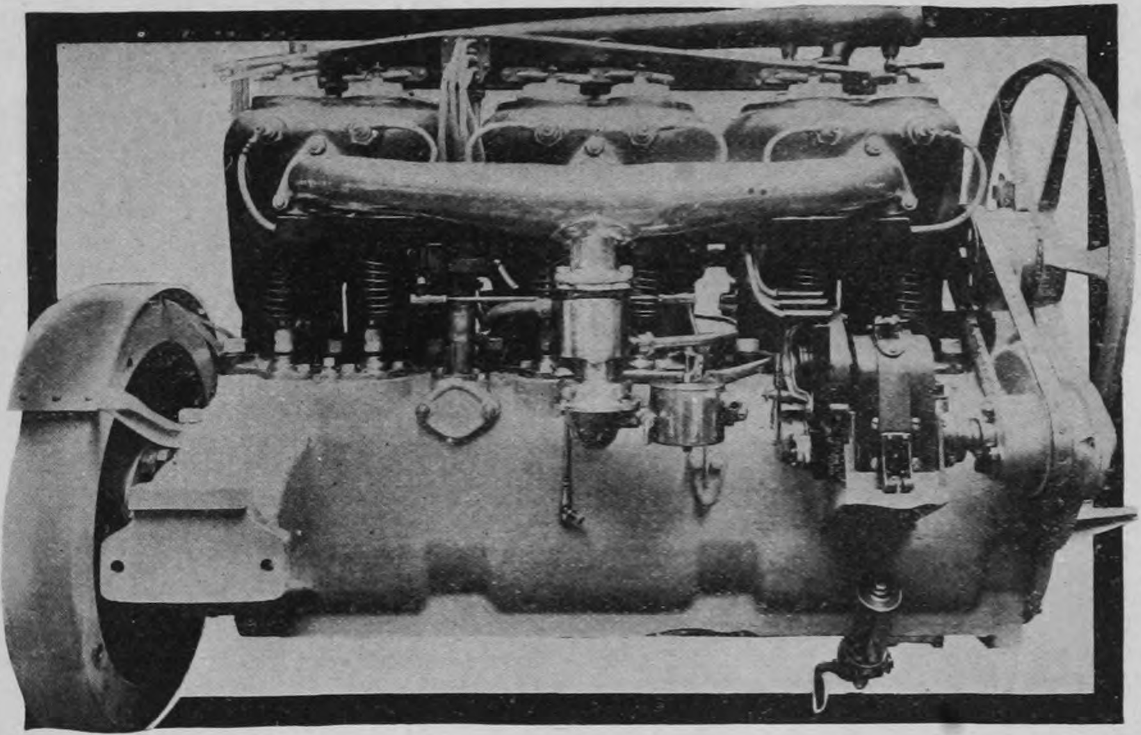


Fig. 3. Intake side of the Thomas Model M 6-cylinder motor. Attention is called to the large inlet manifold, the special bracket carrying the magneto which is held by an easily removed yoke with thumb screw retention. Note the wires leading to the plugs at the side of the cylinders and over the cylinder heads can be seen an insulating bar carrying the wires to the plugs in the heads, this latter set being used for the Atwater-Kent Unisparker.

THE CLUTCH.

The patented Thomas three-disc clutch, which has been found to give excellent results in the past, is used on the 1910 product. The clutch disc is carried on two imported annular ball bearings, so that a scarcity of lubricant will not cause dragging.

The new clutch has the good features of the clutch previously used in that it is provided with cork inserts and has a double adjustment.

One detail to be mentioned in this connection is that the clutch operation has been made much easier by cranking the cross clutch shaft, so that less foot pres-

impossible. For this reason between th clutch and the transmission are two universal joints of the internal gear typ which have been found to give such e ceptional service on motor trucks, wher all other forms of joints failed.

THE CHANGE GEARS.

The transmission complete weighs 8 pounds, which is less than two pounds pe horsepower. This part of the mechanis is fitted with imported annular ball bea ings and has been designed not only pra tically but theoretically correct, all part being proportioned according to stress di grams obtained by the methods of Graph cal Statics.

The transmission was designed to secur very short shafts and so have great rigi ity. The annular bearings of the counte shaft are but 8 7-16 inches center to ce ter, and six annular bearings are used i the transmission.

The gears are of nickel steel, heat-trea ed by pack hardening in bone, allowi them to cool in the pot, reheating to b tween 1375 degrees and 1425 degrees ar finally quenching in oil.

The rear axle is made by Timken. I casing is of pressed steel. Timken roll bearings are used throughout. The gea are four pitch with three to one ratio.

The front axle is made of nickel ste as are also the steering arms.

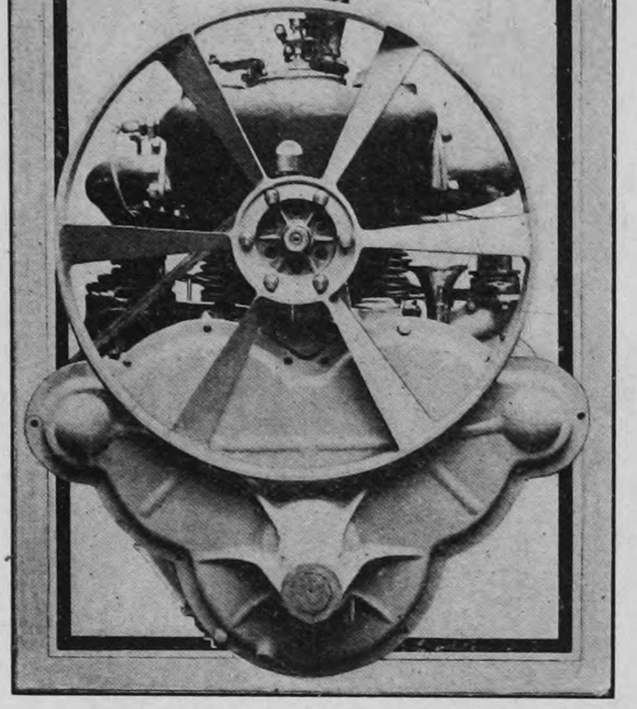


Fig. 4. Front view of the new motor showing the complete housing of the gears and the large fan substantially mounted on its bearings carried by a special bracket on the end of the case. This fan is driven by a V type motorcycle belt.

neto furnishes current for one set plugs, while the very successful Atwate Kent Unisparker supplies the current f the second set.

The engine piping is of drawn copp tubing made in neat form giving addition beauty to the engine.

Among the little things that mark t good car should be mentioned the new ba and socket joint for operating the magnet carburetor and other minor controls. Th joint, it is stated, was most carefully d veloped after three weeks of work and adjustable to 1-360 of an inch.

The fenders and running board apron a solutely prevent any mud from splashi on the passengers.

Both in general design and in attentio to small details, the 1910 Model "M" w rank well with any of the cars in t world's market to-day. With full passe ger load, gasoline, oil and water, the Mod "M" has one horse power (A. L. A. M. ra ing) for every 94 pounds of weight. Th experienced will at once realize what th means in hill climbing ability, and ge eral all-around performance.

The Interstate Automobile Co., of Muncie., Ind., are now building a 440 by 140 addition to their present plant and plan to produce 2500 cars for 1910.

Notice has been given that William C. Schoelkopf and H. C. Biddison, co-partners, doing business under the firm name, The Schoelkopf Manufacturing Company, of Madison, Wisconsin, have dissolved partnership. H. C. Biddison has purchased the entire interest of William C. Schoelkopf and will continue the business at the old stand under the name of The Biddison Manufacturing Company.

The great demand for Remy magnetos has led the Remy Electric Company, of Anderson, Ind., to establish branch selling offices at Kansas City and San Francisco. Mr. Edward F. Willett, of the New York office, will take charge of the San Francisco branch while Mr. Ross E. Luellen, of the home office, will manage the Kansas City office.

The Gramm-Logan Motor Car Co., of Bowling Green, Ohio, announces the closing of its first fiscal year and at their stockholders' meeting held recently, the year's business was found to have resulted in a very satisfactory manner to the stock-

formed with a capital of $100,000, know as the E. R. Thomas Motor-Branch Con pany. The officers are: E. L. Thoma president; J. M. Edsall, secretary an treasurer; C. S. Henshaw, manager. The temporary offices are at 288 Columbus av nue, Boston, Mass.

The incorporation of the Westinghous Storage Battery Company, of Boonton, N J., has been announced. The new conce has taken over the equipment, patent plant and business of the storage batter department of The Westinghouse Machin Company and of the General Storage Ba tery Company.

The Mason Automobile Co., of De Moines, Iowa, is moving its plant t Waterloo, Iowa, having recently purchase the Waterloo motor works, which is factory of 100 by 300 feet and three storie high. The company will increase its cap tal stock to $1,000,000. About 300 peopl

James E. Plews, representing the Whit Steamer Automobile Company, has lease from George Holt the property at 263 2709 Wabash Avenue, Chicago, Ill., at a annual rental of $1,500, for the ground an 7 per cent. on the cost of the buildin

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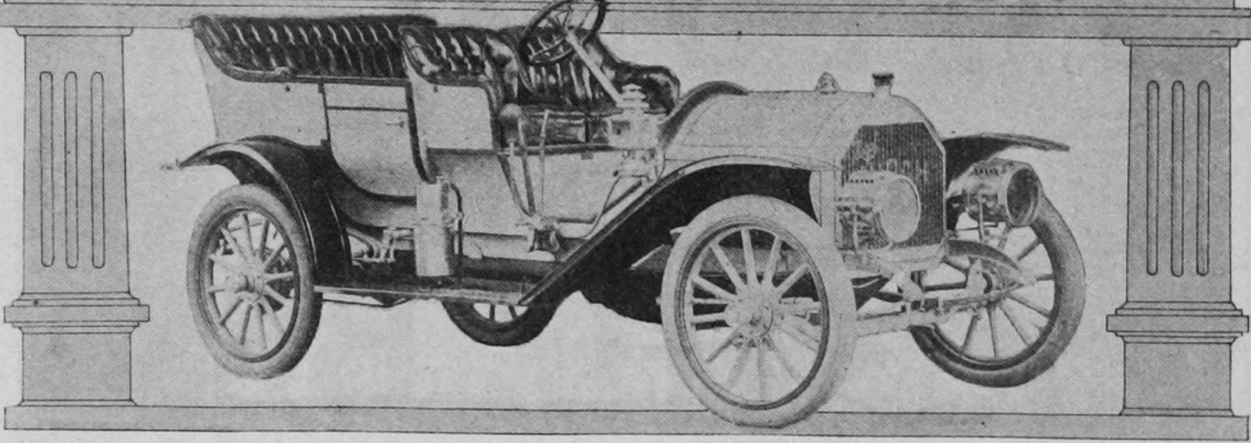
The REGAL 30



The 1910 model of the Regal 30 is a continuation of the 1909, the difference consisting only in some minor changes, not affecting the principals of construction, out adding little points for the convenience of the user, or for the improved operation of the car.

The motor is still a 4x4, valves on one side, with leather faced cone clutch, enclosed grease tight universal joints, and with the three speed selective transmission ocated on the rear axle.

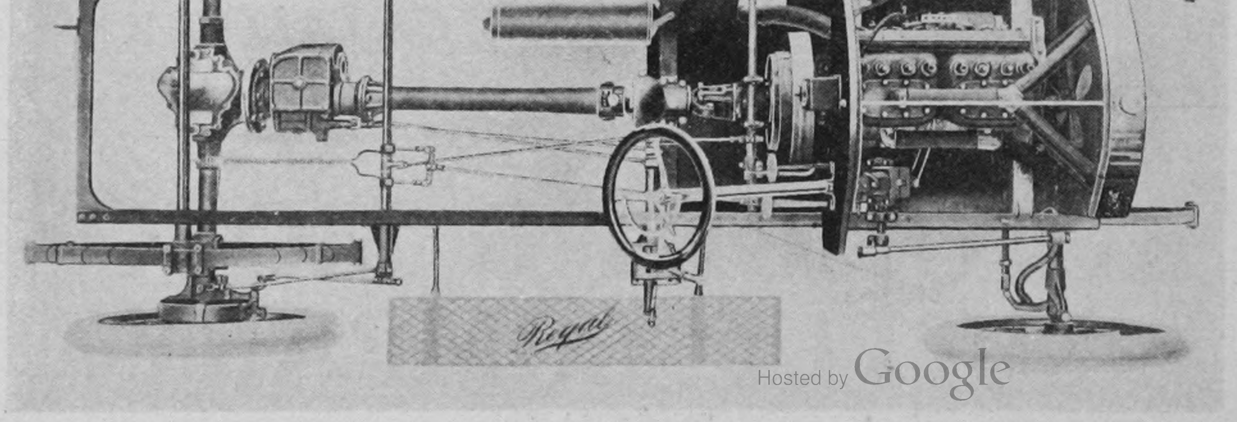
The wheel base has been lengthened wo inches, making it 107 inches. The ody has been made a little roomier and with better lines, and this together with he curved dash and new fenders gives he car a somewhat different and improved ppearance.

ENGINE REFINEMENTS.

The engine has been refined in several particulars. The pistons now are equipped with three rings above the piston pin and one below, thus making an additional precaution against compression, leakage, an serving to keep an excess of oil from getting past the piston, if at any time to much of the lubricant should be poure into the case by a careless user. A pressed metal float has been provided in th lower case which indicates the height o the oil by means of a stem which extend from the float up through a glass tube located on the upper crank case. As thi tube is air tight and the oil never gets int it, it is always clean and the stem is easil seen. Any sight tube that contains oil wil very soon become dirty and make it almos impossible to determine the level.

The fan has been removed from the radiator and is now placed on an adjustabl bracket attached to the cylinders an braced by the lower crank case. This fan equipped with ball bearings, is driven wit a "V" belt, and needs oiling only once o twice a season.

A gear pump is provided as formerly except that the housing of the pump i



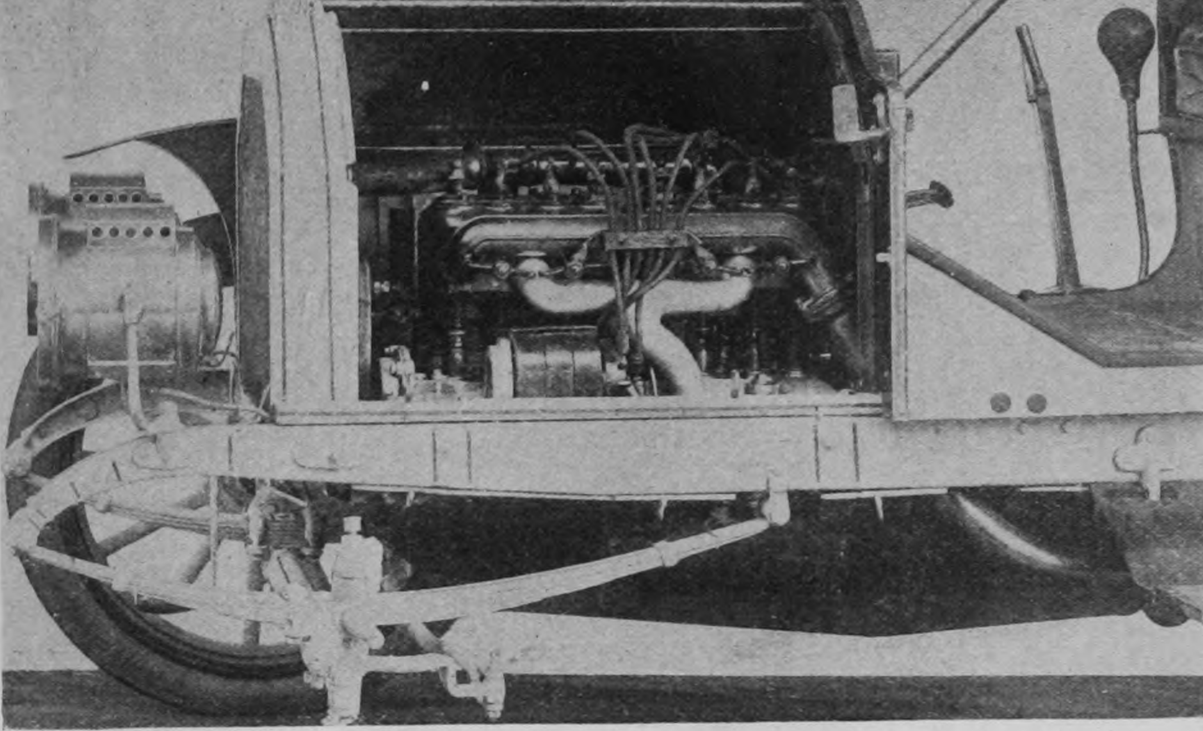


Fig. 2 Forward end of the 1910 Regal chassis, showing the engine in the hood, the arrangement of t wiring and the long front semi-elliptic springs upon which the axle is mounted considerably forward of the cent The complete housing of the mechanism by the under pan is also shown.

made in one solid piece, thus saving about one-half the weight and doing away with the possibilities of a leak at the union of the two castings.

A long cylindrical strainer is provided at the intake, and the oil is discharged through a steel tube on to the main bearings. An overflow returns the oil to the reservoir which holds about a gallon and a half.

A breather pipe, about twice the capacity of the old one, has been provided, which not only effectively releases any crank case pressure, but also provides a very easy means of filling the oil tank. A baffle is provided in this breather pipe which effectively prevents the smallest

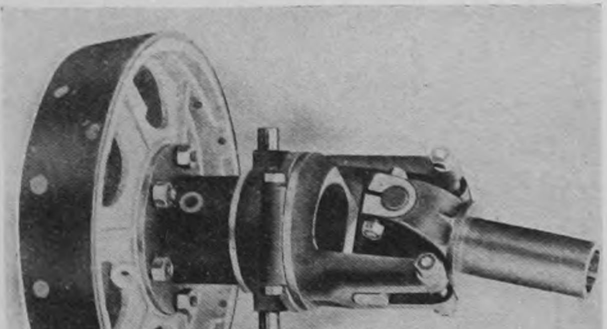


Fig. 3. The Regal leather faced cone clutch fitted with cork inserts as used in the 1910 models. To the rear of this clutch is an efficient universal joint as shown.

play in its bushing, it will cause a knc and is sometimes very hard to locate. guard against this trouble, the rear bushing is threaded so that it may pushed backward or forward to give exact fit between either end of the c shaft flanges: slots being provided in bushing by means of which a dowel holds it in place.

THERMO-SYPHON COOLING.

The cooling system on the Regal thermo-syphon and it is claimed proven so successful that not a single co plaint has been received on the wh year's output. If as in some systems pipe extends from the engine to the tank of the radiator, a slight lowering the water level might leave an open s in the system so that the water will circulate except in spurts when eno steam has been generated to push water over the intervening space. To ov come this difficulty, the pipes have b lowered so that they rise on a slightly clined line which permits the water le dropping to a much greater extent be the circuit is broken. Now, should central tank extend entirely through radiator, there would be a hot strean water tending to rise, which upon coo tends to drop through the same tube, giving two forces working in opposite rections. In the Regal system, howe the tank extends only half way thro the radiator so that the hot water rise the rear becomes cooled and desc

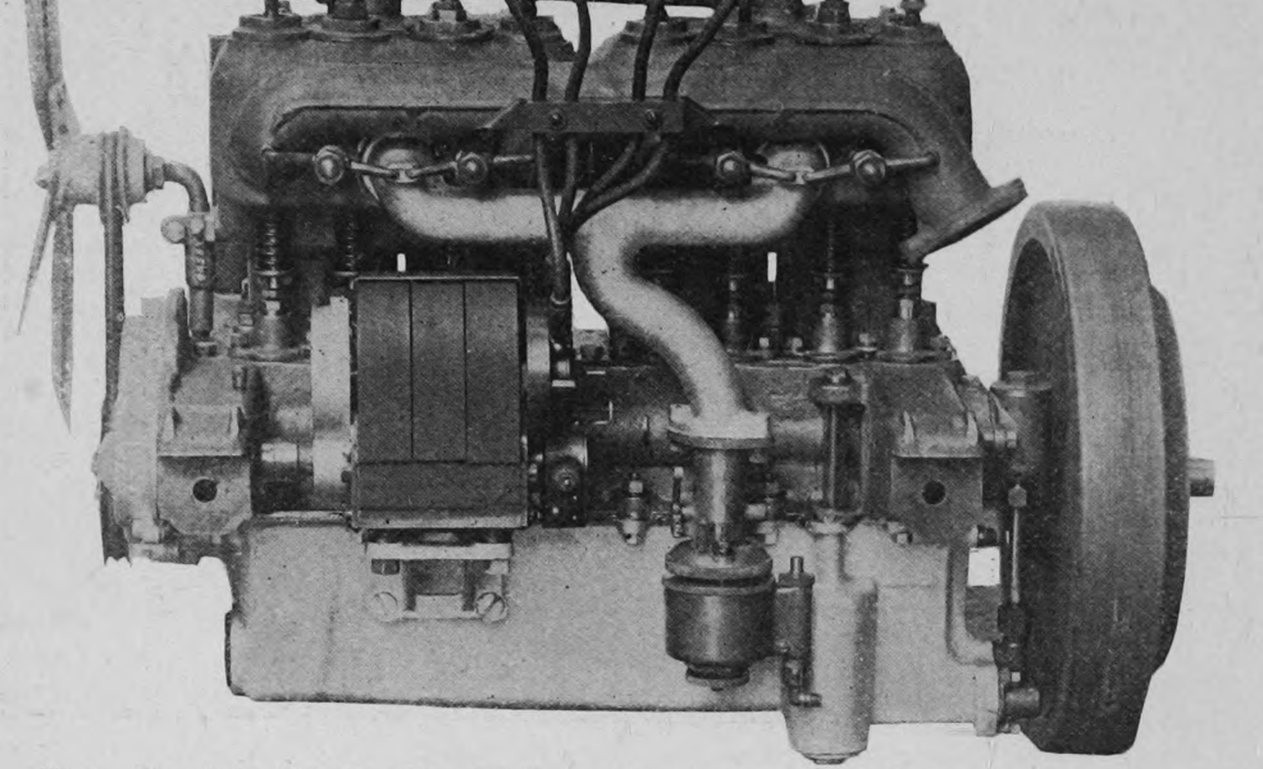
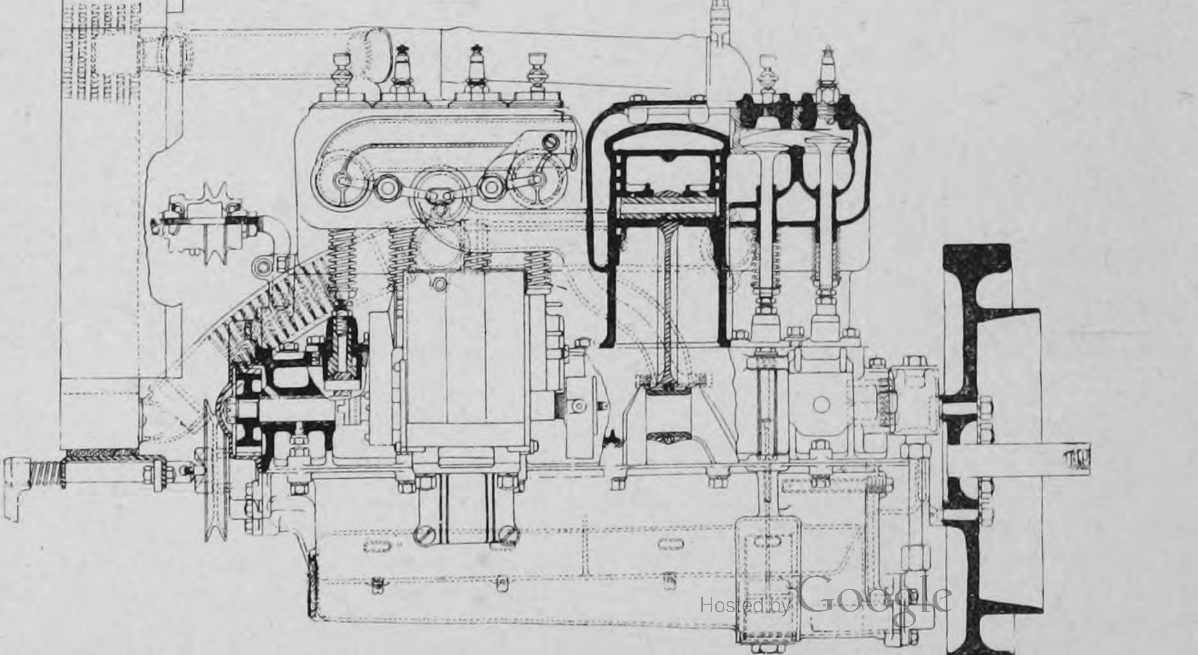


Fig. 4. View of the valve side of the 1910 Regal motor, cylinders 4 by 4. Attention is called to the ample sized thermal water pipe, the method of holding the exhaust and inlet manifolds by yokes, a special bracket for he magneto and its drive through an Oldham coupling from the half-time gears, and the arrangements of the special oiling system, with gauge glass as described in the text.

pe is used at the bottom and two 1½ ch pipes at the top, which together with e free passage through the water jack-s allow an uninterrupted flow, which is ecessary in a successful thermo-syphon ystem.

The leather faced cone clutch has proven satisfactory that no changes have been ade. This applies also to the universal joint in the ball end of the propeller tube.

The transmission located on the rear axle has been improved by the use throughout of high duty nickel steel Hyatt bearings. All these bearings are incased in solid, hardened and ground bushings, and run upon hardened and ground ends of the shaft itself. Thorough and exhaustive tests have proven this transmission to



The shafts and gears are all of nickel eel; the gears being cut with teeth spe-ally constructed for strength at their ase. The diameter of the rear axle tubes as been increased from 2 to 2½ inches, nus giving a construction even more rigid nan its predecessor, and to further im-rove this member, the axle shafts are also eing made of nickel steel.

The most frequent cause of noisy gears n the rear axle is the lack of adjustment r the driving pinion and bevel gear which attached to the differential. On many rs, there is no adjustment in either case, ut this construction is fitted with an ad-sting collar which will move the small evel pinion back and forth, while two her adjusting collars are found in the rear operation. This is a construction found generally in high priced cars only.

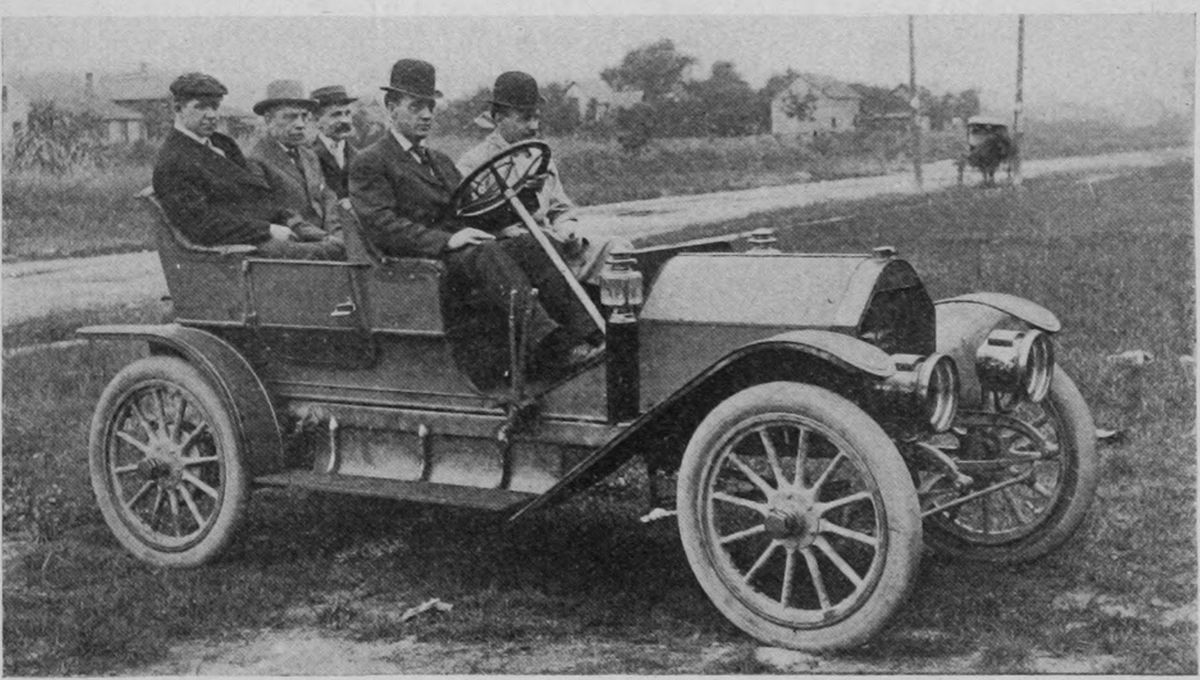
The lines of the body have been improved by the slanting of the seat backs slightly more toward the rear, making one straight line along the arms of the seats and the top of the door, and by making a plain door without a break at the middle.

The seats and the doors are made of sheet metal while the material of the under body as heretofore is wood. More clearance has been given between the wheel and the fenders, and the dash has been curved at the top to follow more closely the top of the bonnet.

This year's models include full lamp equipment and generator, as well as a Remy magneto, horn and cutout on muffler.

The Great Western "30"

The Great Western Automobile Com-any, of Peru, Indiana, has planned for an tput of 1,500 cars for the season of 1910. is said that more than three-quarters of is output has so far been contracted for nd deliveries have just commenced.

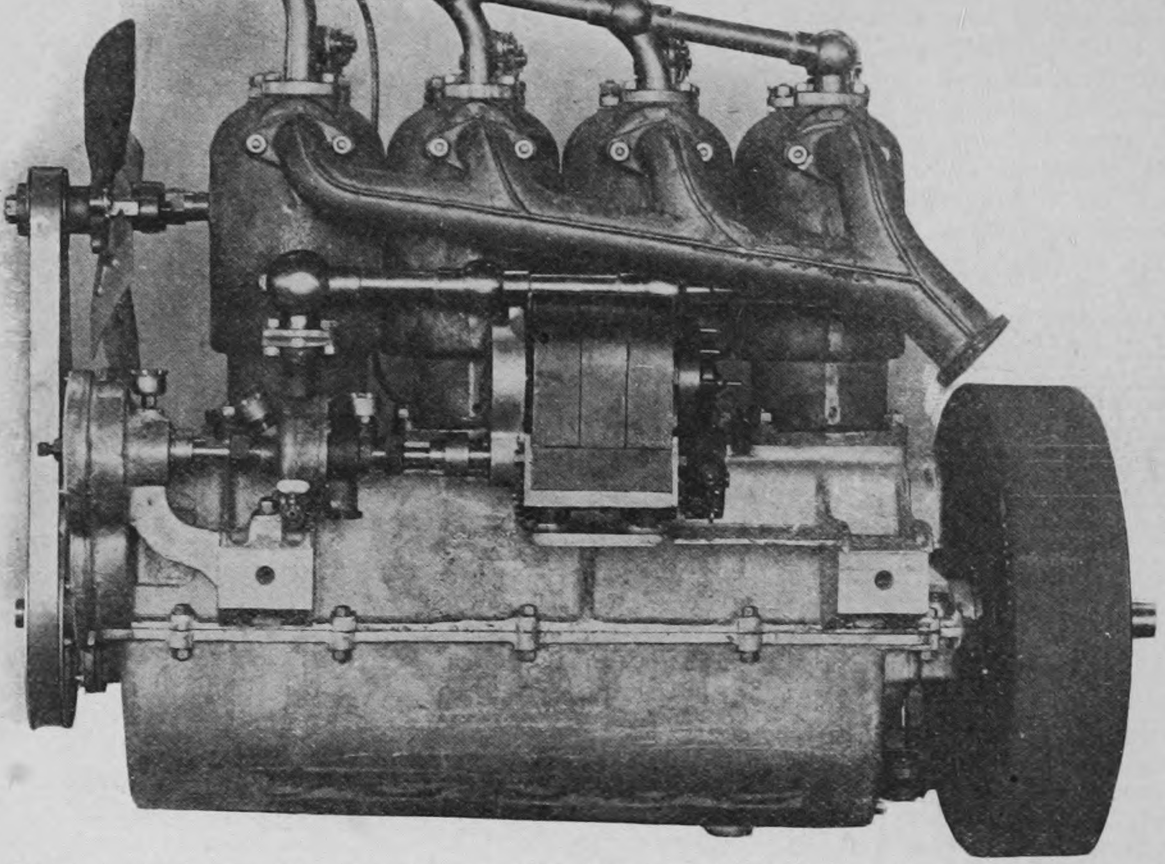


The Great Western "30" 4-cylinder, four cycle water cooled; cylinders cast separately; 4¼ inch bore, 5 inch stroke; sliding gear, selective transmission; 56 or 60-inch tread; 112-inch wheel base; baby tonneau body; equipment, magneto, five lamps, generator, tool box, robe rail, horn, full set of tools and repair kit. Price $1,600.

This concern is making rather rapid rides at the present time, and has been anufacturing cars on a conservative asis under the name of the Model Auto-obile Company, which name, however, as been changed recently, in order to void the confusion which has arisen in e past on account of the Model Company uilding Great Western cars. This com-

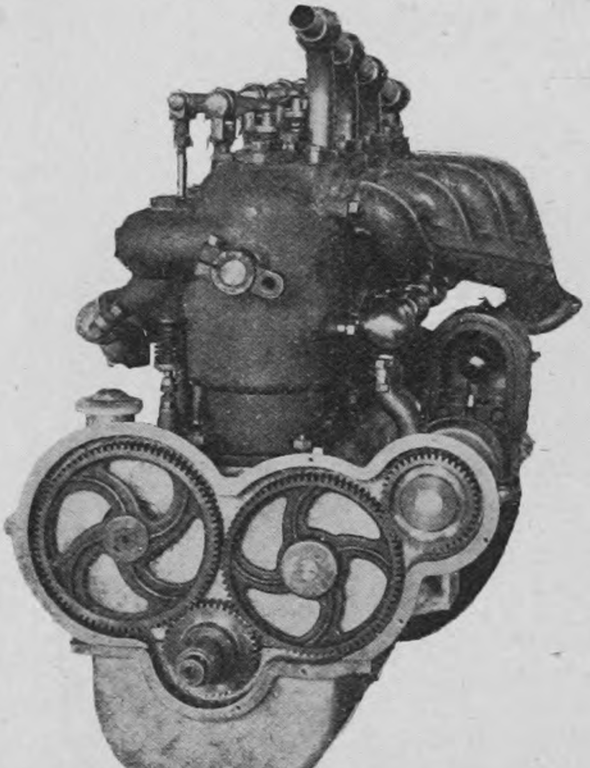
The cylinders are of the best grade of close grained grey iron, cast in dry sand molds which are baked the same as cores are baked before castings are made. This insures uniform metal throughout. The cylinders are bored to a diameter a trifle smaller than the finished size. They are then aged in order to let them obtain their normal shape after which they are placed in a jig and ground to absolute measurement. The cylinders are ground in the inside clear to their ends and the heads are machined in order to lessen the accumulation of carbon.

All parts are absolutely interchange-



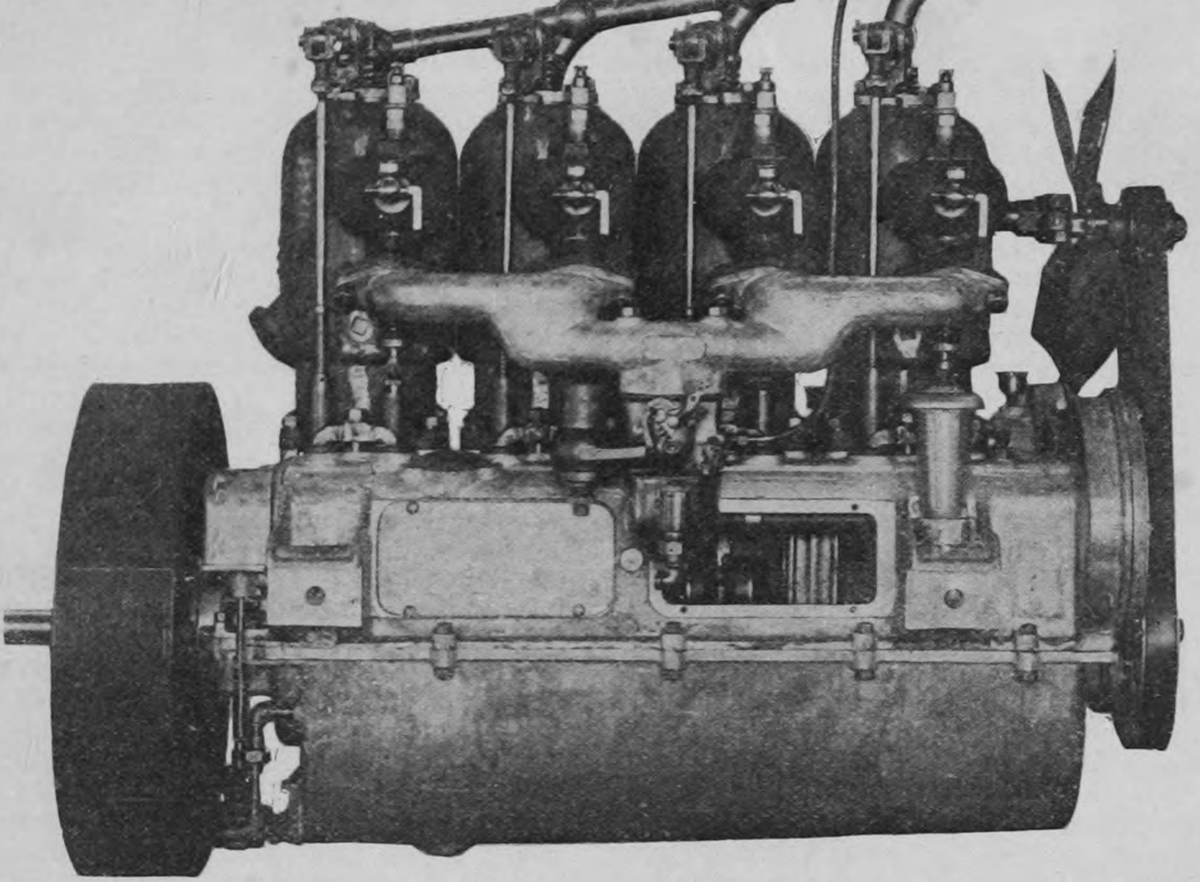
Exhaust side of the Great Western "30" motor. Particular attention is called to the design of the exhaust manifold, which enlarges as it nears the muffler pipe. As will be noted from this view the pump and magneto are operated from one shaft.

ribbed for the purpose of reducing weight. They have convex heads to strengthen the construction and reduce the expansion. Each piston is annealed to take off all unequal strain of the metal and then ground to measurement. The pistons are fitted with four eccentric expansion rings and a snap ring to hold the piston pin in place. They also have oil grooves so as to distribute the oil to the cylinder walls uniformly. Each piston is machined on the inside to a given weight so that the pistons can be interchanged without throwing the motor out of balance.



The bore of the motor is 4¼ inches and the stroke 5 inches. The crank shaft is offset and consequently with the long stroke develops maximum power, it is claimed, at a moderate rate of speed.

The crank case is cast of the highest grade of aluminum alloy. It is very light and at the same time exceedingly strong and rigid. The working stresses of the cylinders are not upon the crank case but are taken up entirely by steel studs of special formula that bolt to the cylinders and support the crank shaft caps. Four spacious hand-holes provide means for inspecting the connecting rods. The bottom half of the crank case can be removed without disturbing the crank shaft or other parts. A vent pipe of ample proportions relieves the crank case compression. This vent pipe is so constructed that oil cannot possibly be thrown out and yet the compression is readily released.



Intake side of the Great Western "30" motor; 4¼ inch bore, 5-inch stroke; five bearing crank shaft of ample proportions; crank case of aluminum.

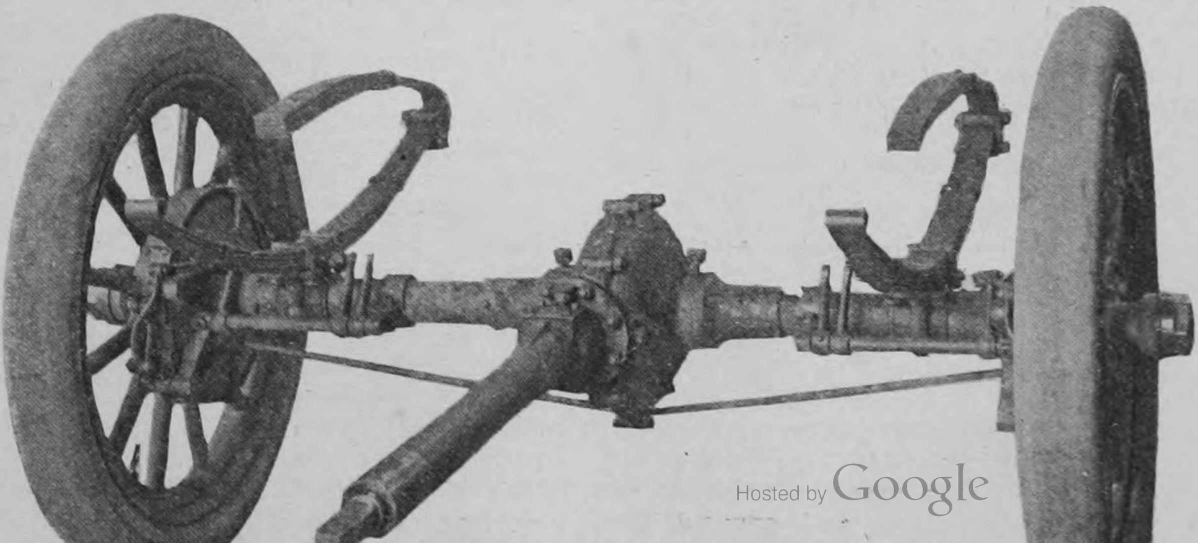
4½-in. bearing surface. The crank shaft s a solid forging with a flange to which he fly wheel is bolted, being forged in- egral with the shaft.

The connecting rods are of drop forge steel of I beam section, with nickel babbitt die cast bearing on the piston end.

The cam shaft is a solid forging with ll cams cast integral and is provided with hree main bearings. This cam shaft is o arranged that by loosening the nuts on wo of these bearings the cam shaft can be withdrawn without disturbing the motor adjustment. All ground parts in the motor are ground to one-half of one thousandths of an inch limits.

The reader's attention is called to the cut showing the exhaust side of the motor. It will be observed that the exhaust manifold enlarges as it nears the muffler pipe, thus taking care of the expansion of the exhaust gases. There are also no sharp bends to cause back pressure.

The oil reservoir is in the bottom of the crank case and a constant level is maintained at all times. The oil is driven



through the motor by a gear pump. Other parts of the machine are liberally supplied with oil cups. The motor is supported on a sub-frame.

The front axle is a one piece nickel steel drop forging of I-beam construction with a drop in front. This front axle is strongly constructed and heavy enough for cars with several hundred pounds more than the 2,000 pounds which the Great Western "30" weighs. . .

The rear axle is driven by a shaft enclosed in a tubular housing and it is of semi-floating type.

The wheels are of the artillery type with large spokes and are 34x3½ inches. They are fitted with Q. D. rims. The rear wheels are fitted with two internal expansion brakes and two external contracting brakes on pressed steel drums.

Attention is called to the enclosing of the timing gears in an oil tight case, which constitutes one of the features of the 1910 model. The magneto has also been taken away from the carburetor side and put on the exhaust side of the motor so that the pump and magneto are operated from the same shaft.

The transmission is of the sliding gear selective type giving three speeds ahead and one reverse. The transmission gear case is of aluminum. A locking device is fitted which prevents the gears from sliding out of commission and it is impossible to engage two gears at the same time.

The clutch is of the cone type, and is lined with raybestos covering, riveted on with copper rivets. Springs are placed underneath the surface so as to insure easy engaging. The carburetor which is a Schebler is hot water jacketed. Brass water pipes are used, which allows few joints where there is any possibility of leakage. The fan is driven by a one inch fan belt. Below the motor, clutch and transmission is placed a pan which is hinged on one side and held up by catches on the other.

The springs are of the semi-elliptic type in front 38 inches long, and three-quarter scroll elliptic in the rear, 42 inches long. The spark and throttle levers are placed on top of the steering wheel. The latter is 18 inches in diameter. The wheel base is 112 inches and either 56 or 60 inch tread is supplied.

The gasoline tank has a capacity of 20 gallons. The body as shown is of the baby tonneau type. The price of this car is $1,600 f. o. b. Peru, which price includes Remy magneto, gas lamps, generator, oil lamps, a large tool box, on the running board, a robe rail, horn, and a complete set of tools.

In order to accommodate the great increase in its business, the Firestone Tire & Rubber Co., Akron, O., has purchased 15 acres of land near its present plant and will erect an immense model rubber tire factory.

The Krit Motor Car Co., of Detoit, Mich., has been incorporated to manufacture a four-cylinder car designed by Kenneth Crittenden. The capital stock is $100,000, of which $50,000 is subscribed and $23,000 paid in models, specifications, machinery and completed cars. The incorporators are B. C. Laughlin, W. S. Piggins, Claude S. Briggs, Kenneth Crittenden and C. W. Whitston. Each holds 100 shares at $100 each. A factory will be erected, from which the company expects to put out 2500 cars next year.

York Co. Declares Dividends—At the annual meeting of the Board of Directors of the York Motor Car Company, held recently, a dividend of 7 per cent. was declared, and the following officers were elected: T. C. O'Connor, president; O. Stevenson, re-elected secretary and treasurer, and Geo. S. Schmidt, a prominent attorney of York, was made a member of the Board of Directors, and counsel for the company. A large amount of money was set aside as a surplus, and it was practically decided that the capacity of the plant would be again doubled for 1911.

The Winton Motor Carriage Co.'s Philadelphia branch is to have a new home more than twice its present size. The building now occupied at 246-48 N. Broad street, is being torn down and replaced by a more modern structure. The new building will be completed by January 1st.

Mr. H. B. Marshall, who has been for many years connected with the Chicago sales office of The Electric Storage Battery Company in the Marquette Building, has recently been appointed contract agent, in charge of that company's office at St. Louis in the Wainwright Building. Mr. Taliaferro Milton, formerly contract agent of the St. Louis office, has been appointed engineer of the Chicago sales office of The Electric Storage Battery Company.

Arrangements are practically completed whereby the ownership of the large tube works in Hartford, Conn., will pass from the Shelby Steel Tube Works, of Pittsburg, Pa., a subsidiary company of the United States Steel Corporation, to the Pope Manufacturing Co. The plant occupies nearly five acres of ground, and the buildings have two acres of floor space, nearly all of which is on one floor. The increased facilities will add very materially to the efficiency of the output of the Pope Co., and will be the means of furnishing employment to many additional workmen.

Locomobile

1910

30 Shaft Drive
40 Chain Drive

THE BEST BUILT CAR Locomobile IN AMERICA

Touring Cars, Roadsters
Limousines, Landaulets

LOCOMOBILE DEALERS

Albany, N. Y., Taylor Auto Co., 33 Orange St.
Allentown, Pa., James K. Bowen
Amsterdam, N. Y., William Daye
Baltimore, Md., Callahan, Atkinson & Co., 1020 Morton St.
Bangor, Pa., S. A. Teel & Co.
Bath, Me., H. Washburn
Betteavia, Cal., J. A. Litzenburg
Bristol, Conn., J. B. Sessions
Brockton, Mass., W. H. Marble, 69 Main St.
Brooklyn, N. Y., I. S Remsen Mfg. Co., 750 Grand St.
Champaign, Ill., L. S. Wilcox
Charleston, Ill., A. L. Hardin
Cincinnati, O., Hanauer Auto Co., 115 E. 7th St.
Cleveland, O., H. R. Hoffman Auto Co., 1806 Euclid Avenue
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Concord, N. H., New Hampshire Auto Co., 24 School St.
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Dayton, O., Peoples Motor Car Co., 19 W. Second St.
Des Moines, Ia., Iowa Auto & Supply Co.
Eau Claire, Wis., Hobbs Supply Co.
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Evansville, Ind., Harnishfeger & Charley
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Los Angeles, Cal., Los Angeles Motor Car Co., Pico and Hill Sts.
Louisville, Ky., George Looms
Lowell, Mass., Paschal Sprague
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Memphis, Tenn., Bruce, Cubbins Co.
Mexico City, Mexico, Compania Mexicana de Vehiculos Elec., 4 a Humboldt
Milwaukee, Wis., Schreiber Motor Car Co., 175 Fifth St.
Montgomery, Ala., Loeb Carriage & Supply Co., 120 Commerce St.
Natick, Mass., J. D. Macewen
Newark, N. J., Greene Motor Car Co., 90 Washington St.
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New Britain, Conn., E. A. Cryne
New Haven, Conn., Automobile & Supply Co., 69 Broadway
New Orleans, La., Automobile Co., 1126 Tulane Ave.
New York City, Locomobile Co. of America
New York City, J. C. Hernandez, 90 Wall St. (Spanish-American Countries)
Norwalk, Conn., F. E. Lockwood & Co.
Oakland, Cal., S. S. Southworth, 227 Twelfth St.
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Ottowa, Ill., W. H. Knowles
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Wichita, Kans., Smyth Motor Car Co.
Wilmington, Del., Bradford Company
Wilkes Barre, Pa., Wyoming Valley Motor Car Co., 35 N. Washington St.
Yonkers, N. Y., Yonkers Auto Station

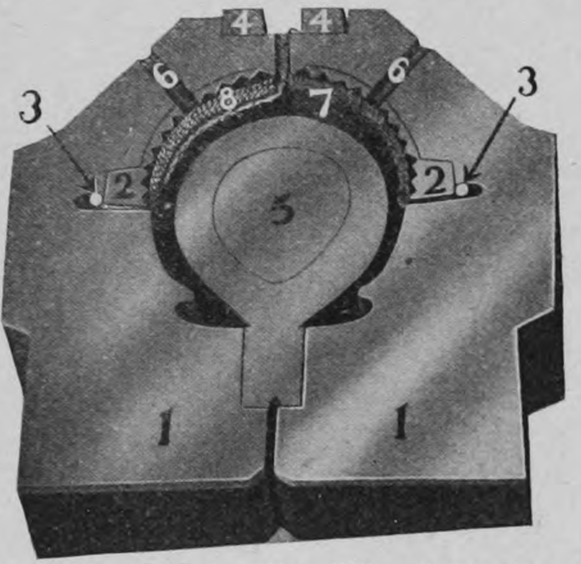
The Locomobile Co. of America

BRIDGEPORT, CONN.

New York **Boston** **Philadelphia** **Chicago** **San Francisco**

ny, of Akron, Ohio, are offering to tire anufacturers a new tire mold which is aimed to be a radical improvement in e art of manufacturing automobile tires. ne new method it is said combines the vantages of the molded and wrapped ead processes without the disadvantages either.

The accompanying cut is a sectional ew of the Akron-Williams mold, which constructed as follows: The two ain halves (1) are pierced by numerous oles (6) to permit the circulation of eam and the escape of condensation and ses from the inner cavity. The inner rfaces of the mold sections are corrugated as shown. In direct contact with ese corrugations which conform to the sired profile of the tire tread, is insertl a layer of heavy brass wire gauze (8). he latter is tightly stretched and is held position by the circumferential wire 3) soldered to same, and by steel lockg rings (2) and (4). In close contact ith this wire gauze and held in position the same devices is a layer of duck or nvas (7). The tire bead and side walls e formed in the cavity between the iron de mold and the core (5) and the tread eing formed in the cavity between the bric (7) and the core (5). If desired an r bag may be substituted for the core own in the engraving.



Sectional view of the "Akron-Williams" Tire Mold.

It will be noted that this construction ves full mold pressure to the side walls d bead of the tire and applies practical- the same pressure uniformly to the ead portion of the tire. As but one thin yer of canvas (well supported) comes tween the rubber of tread and live eam, the latter penetrates the porous ire mesh and canvas to the tire tread,

out and may then be quickly renewed. The molds are shipped complete with wire gauze and canvas in position. The wire gauze lasts indefinitely and does not require renewal.

When the canvas is worn out, the old pieces are removed, and new sections cut to proper form, their edges caught by the clamping rings and the canvas stretched snugly across that part of the mold which forms the tread. The canvas is then dampened and the former or dummy ring conforming to the size and shape of the finished tread is laid on the canvas. The other half of the mold is then treated in the same manner and the two halves bolted together with the dummy inside. After half an hour the mold may be taken apart and the dummy removed. The canvas will be found free from wrinkles and in perfect contact with the wire mesh backing, and a perfect outline for the tread of the tire.

The principle of this mold is not confined to the single cure process, but is just as well adapted for applying the tread in the two cure process, also for retreading old tires.

The molds may be had in the regular bolted form for use in the vulcanizer, in steam jacketed form so that each mold provides a complete vulcanizing plant in itself, or without the bolts or steam jacket for use in vulcanizing presses.

"REX" METAL CREAM

"Rex" Metal Cream is used for cleaning and polishing all kinds of metals, and automobilists will find it useful in keeping the steel, nickel, copper and brass work on their machines bright and shiny.

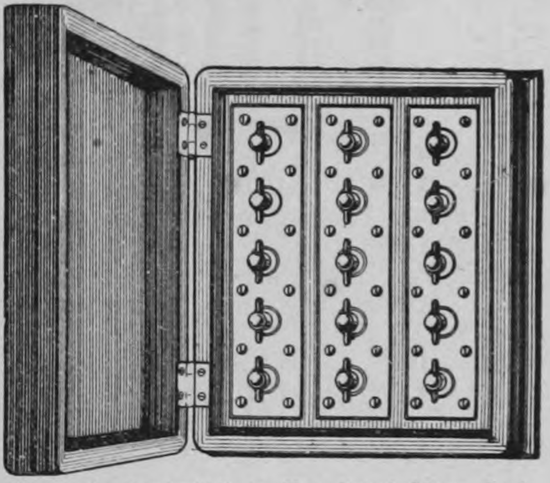
It is claimed that it will not settle hard in the can, allowing the entire quantity to be utilized. "Rex" polish is manufactured by the Armiger Chemical Company, 766-68 Austin avenue, Chicago, and is put up in cans containing from ½ pint to 1 gallon.

We have been informed that the Muncie Foundry and Machine Co., Muncie, Ind., have thoroughly equipped their plant for the purpose of making a specialty of grey iron castings for automobile, boat and power gas engines. This company intends to furnish a strong, semi-steel casting, easily machined and capable of standing the strain to which castings of this character are subjected. Mr. A. C.

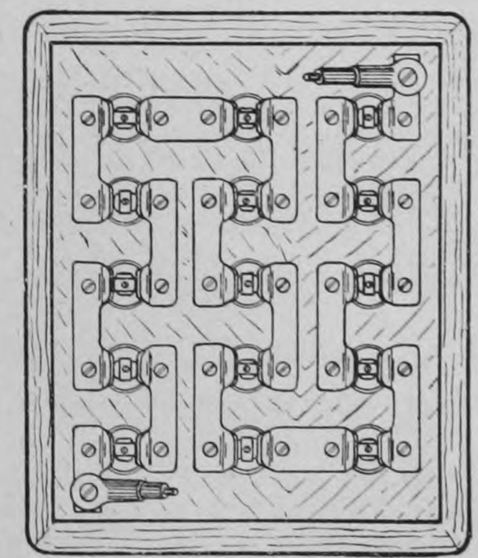
AND MOTOR BOATS

The Loxit Motor-Locks Company, of North Tonawanda, N. Y., has recently placed on the market the "Loxit," which is a device for locking the motor, by locking the batteries and both low and high tension magnetos.

The accompanying cuts show two views of this device. No keys are required to operate it, thus making it impossible for irresponsible hands to have duplicate keys made which might cause the owner endless annoyance and quite likely the destruction of his car or boat. The Loxit is made in 10 and 15 key board combinations, the former size being capable of 2,046 combinations, while the latter allows of 65,564 combinations. These two sizes are catalogued as type "A" and are designed for locking the batteries and low tension magneto when the battery and magneto circuits are wired in common



The Loxit Type "A" 15 Key Board Motor Lock.

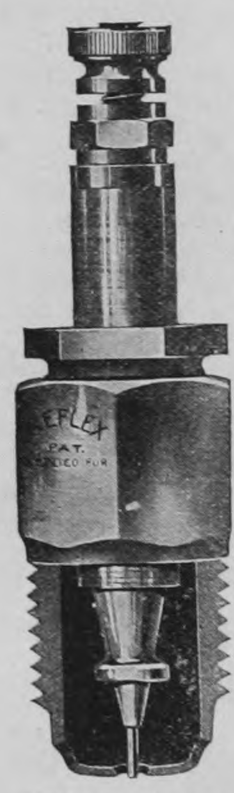


Interior view of the Loxit Type "A" Motor Lock.

Type A, 15 key board, is 5¾x6¾ inch
in diameter and the 10 key board si
4¼ by 6¾ inches. The Loxit can be co
veniently located on the dashboard
baseboard of the seat or elsewhere;
concealed if desired. It does away wi
the need of removing switch plugs, and
is claimed, cannot be short circuited. T
price of the 10 key board lock is $10 a
the 15 key board lock $15, in either of t
three styles.

"REFLEX" SPARK PLUG

The spark plug illustrated herewith
manufactured by the Reflex Ignition Co
pany, 2124-26 East Second street, Cle
land, O. The Reflex pl
has double insulati
The inner section is
thin strip of pure mi
50 inches long, roll
lengthwise onto the st
core. The outer secti
is a series of mica wa
ers which act simply
protection to the in
insulation. The core
machined from a so
piece of steel with ba
plate which prevents t
oil from reaching the
sulation. The steel co
is tipped with a piece
"Meteor Wire"—the n
platinum-nickel alloy
steel. It is claimed t
tip will not oxidize, wa
nor become spongy. T
core is held in place
two bronze seats, requ
ing no packing. T
shell is machined from
solid bar of cold roll
steel, properly tempe
and the spark gap
bevelled, insuring a full hot spark un
every condition.

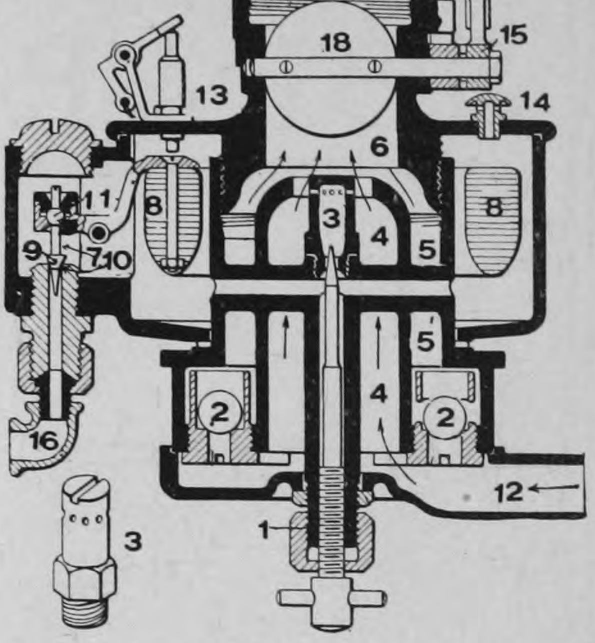


"Reflex" spark plug.

The Reflex is made from the best of m
terials, needs no adjusting, nor renewi
of parts, cannot short circuit and is
affected by an excess of oil or carbon
It sells for $1, is furnished with porcela
if desired and is made in all sizes.

Rushmore Additions—The Rushm
Dynamo Works have recently extend
their capacity by the erection of a la
fire-proof store-house, and will soon bre
ground for a two-story fire-proof concr
extension to their machine shop, 50x
feet, giving them 20,000 square feet of

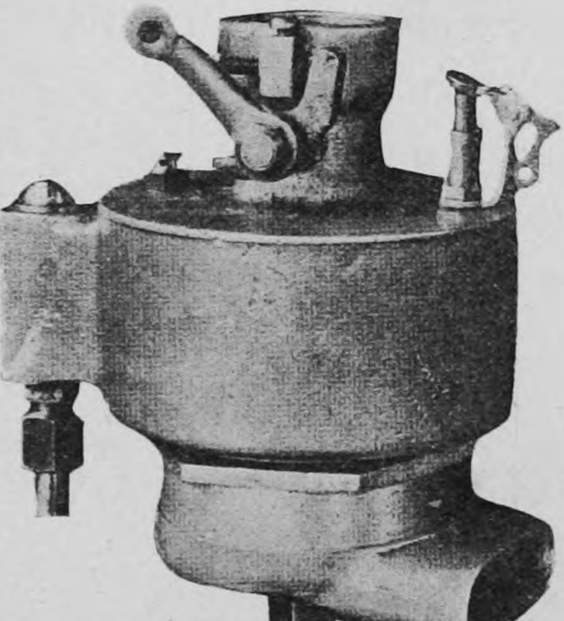
nnard Carburetor Mfg. Co., Kokomo,
d., is claimed to be a radical departure
carburetor construction.
n designing this carburetor Mr. Frank
Kingston kept in view that simplicity
adjustment was one of the essential ele-
ents of good carburetor construction. All
rings which are affected by weather con-
ions are done away with. It is single
justing, having only a gasoline needle
rew to adjust, and can be adjusted at
y opening of the throttle, and will take
re of itself from this adjustment automa-
, controlling the high air by weight, us-
g six bronze balls on bronze seats. The
lls are all of the same size and weight,
different size openings.
The suction of the motor causes a
cuum in the carburetor, thus allowing
e atmospheric pressure to lift ball on
rge opening first; ball on next size open-
g will follow and so on until all are off
seat if the motor needs the opening, and
the motor requires only the opening of
e, or less, only the required amount will
t to feed the motor, thus making the
rburetor automatic. The balls have no
ops; they lift to give the full area of
pening, and then float as a ball does on a
ream of water.
All of the air is taken around the spray
zzle, both high and low, doing away with
e overshot air. The air at both high
d low speeds is strangled thus break-
g up the mixture and giving a more per-
ct gas from low to high, and doing away
th the overshot unmixed air.
The spray nozzle acts as a priming cup
d stands full of gasoline when motor is
le, thus giving a perfect charge of rich
s to start on, making it a very easy
arter. The float is claimed to give more



Sectional view of the "Planhard" Carburetor: 1, needle screw; 2, bronze balls; 3, spray nozzle; 4, constant air opening; 5, high air opening; 6, strangle point for high air; 7, gasoline valve; 8, float; 9, cone shaped bronze valve; 10, knife-edge seat; 11, swinging ball joint; 12, warm air connection; 13, flusher; 14, vent; 15, ratchet lever; 16, gasoline connection; 17, connection to engine; 18, throttle.

than twice the pressure on valve seat than ordinarily used. A cone-shaped bronze valve is used on a knife-edge seat with a swinging ball joint. The seat is made oval so that all dirt will wash off. The feed level is the same at all times no matter if running up hill or down or on a sliding place. All air is taken through the center of the carburetor, thus allowing the piping of warm air to the carburetor for both high and low.

The feature of this carburetor that makes it especially desirable for marine use is its level feed. This feature together with the fact that an air connection can be piped away under the deck of the boat makes it impossible to get water or spray into this carburetor.



THE "SCHWEPPE & WILT" STATIONARY NUT STEERING GEAR

The illustration shown herewith is a sectional view of the Schweppe & Wilt Stationary Nut Steering Gear, manufactured by the Schweppe & Wilt Gear Mfg. Co., Champlain and Meldrum avenue, Detroit, Mich.

The principle of the stationary nut gear is very simple. The worm moves up and down and turns a rocker shaft arm to which is attached the ball arm and the movement can be described best as simply a push and a pull. At the same time this construction produces a gear which abso-

SOLAR LAMPS

Of Special Design

¶ The best and most exclusive designs--patterns that are beautiful in finish and superior in quality and material.

¶ Many American manufacturers prefer distinct lamp equipment for their cars. Something different—Something more Exclusive—Something that will enhance the beauty of their Product and add to the selling qualities. Perhaps it may be a lamp to match the shape of the radiator or bonnet—a lamp of unusual design. THESE manufacturers always use ***Solar Lamps*** because they know that they secure the best that money can buy in motor lamp construction.

The Badger Brass Manufacturing Co.

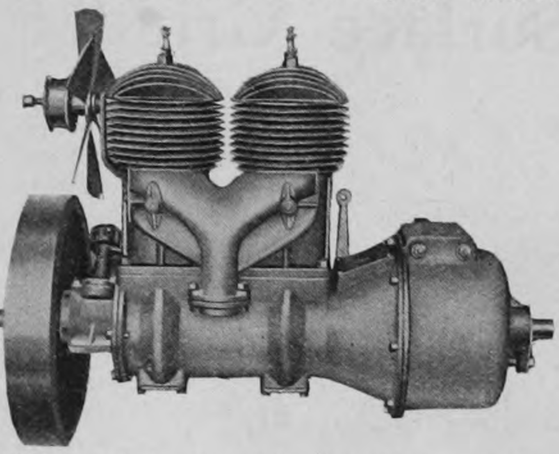
Two Factories:

437 Eleventh Ave.,

placing on the market the power unit ustrated herewith. It consists of a otor with transmission attached.

THE MOTOR.

The motor is a 4⅛x4-in., two-cylinder, r cooled, two-cycle, three-port type. ne cylinders are cast from gray iron th a special process to insure uniformi- and closeness of grain. The crank afts are special forgings made from pre- red crank shaft steel, 1⅜-in. diameter



"Cady" 2-cycle, air cooled motor with transmission.

th extra long bearings, 3¾-in. outside ngths and 3⅝-in. middie bearings, care- ly machined and ground to size. The ank shaft runs in special die cast alloy aring metal.

The method of lubrication used is sim- r to that employed in standard steam gine practice. The user puts the oil o the tank and the motor will be lubri- ed whether it has any attention or not. nition is by a timer, a special spark vi- ting coil and batteries. The motor is cooled by a fan fly wheel and an xiliary fan, which can in most instances taken off.

The engine is flexible and can be throt- d to run anywhere from 150 to 1,500 olutions per minute. The normal speed 1,000 revolutions per minute.

TRANSMISSION.

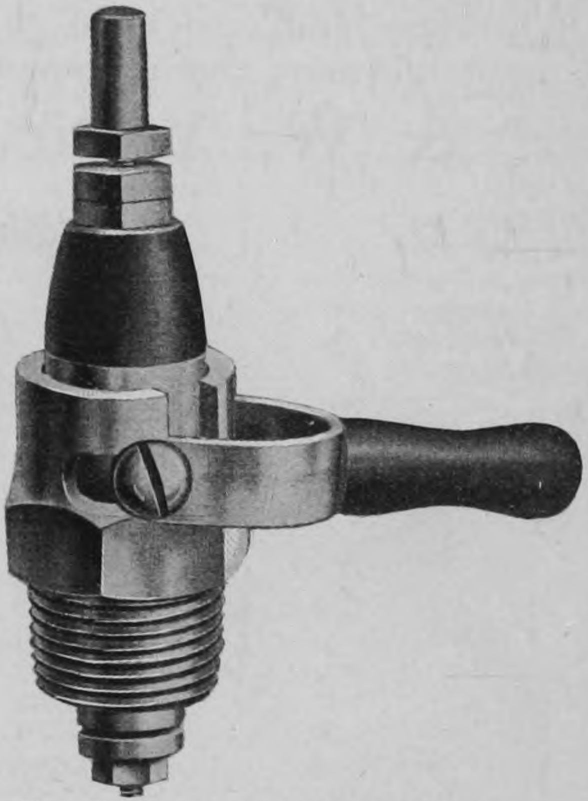
The transmission is a planetary change r, two speeds forward and reverse, the ire change gear and brake bands en- sed in an oil-tight case and running in The gears are of the highest grade, dened. The direct high speed clutch a reliable adjustment, easy of access. e speeds are controlled by two levers y simple to connect up.

he Cady power unit is suitable for any t car up to 1,600 pounds in weight. e motor can be purchased separately n the transmission if so desired.

good roads association has been or-

PLUG

The practical feature of this plug which is marketed by the Knapp-Greenwood Company, 1000 Boylston street, Boston, N. Y., is that it is the only quick detachable plug having both terminals on the detachable member.

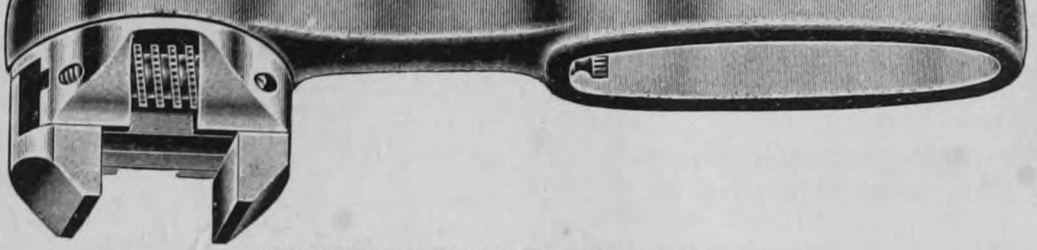


The "Winestock" Quick Detachable Spark Plug.

The central member contains both terminals and can be detached in a second. The spark and spark gap can be tested without unscrewing the plug from the cylinder. It is claimed to be absolutely gas tight and positively will not work loose.

Mr. George A. Breeze, until June 1 identified with the Breeze Carburetor Co., of Newark, N. J., has for the last three months been affiliated with A. R. Mosler & Co., 163 West Twenty-ninth street, N. Y., and has developed an entirely new line of carburetors, which they are there manufacturing. The new carburetor will be described in an early issue of our Journal.

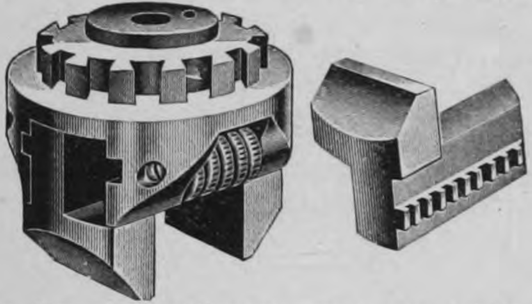
The Timken Roller Bearing Company, of Canton, Ohio, have recently made arrangements with The Electric & Ordnance Accessories Company, of Birmingham, England, to manufacture Timken Roller Bearings in England. The Birmingham firm is controlled by Vickers Sons & Maxim, Ltd., of London, England, one of the largest English commercial firms. It will be their purpose to furnish Timken Bearings to the automobile trade, not only in



The "Wizard" Adjustable ratchet wrench.

"WIZARD" ADJUSTABLE RATCHET WRENCH

The wrench, illustrated herewith is de-
gned especially for use in close quarters
here the ordinary wrenches cannot be
ed. The "Wizard" when once applied
ed not be taken from the nut until it is



e jaws of the "Wizard" wrench; also cut of one
e jaw showing the rack on the side which engages
thumb pinion.

ned as much as desired as a ratchet ar-
gement enables the handle to be
rked back and forth in a small space.

The wrench is easily changed to operate
ht or left by simply giving the knob in
handle a half turn. This reverses the
vl and with it the direction which the
s turn. The parts are all made of drop
ged steel. The wrench is eight inches
g. It is manufactured by the Richards
g. Co., Aurora, Ill., who state that other
es will be made as the demand for them
ses.

THE "LE TESTOPHONE"

The Motor Car Equipment Co., of 55
rren street, New York, is putting on
market the novel horn illustrated here-
h. This horn resembles an ordinary
b horn in its operation, except that
h time the bulb is pressed a piston arrangement moves out, and gives a turn to a ratchet wheel at the base of the four tone group, revolving a valve which directs the air to the various tubes in turn. The effect of pressing the bulb lightly a number of times in rapid succession gives a close resemblance to a military bugle call, as the different notes in the group are sounded in turn and sometimes in combination. These variations can be changed at will.

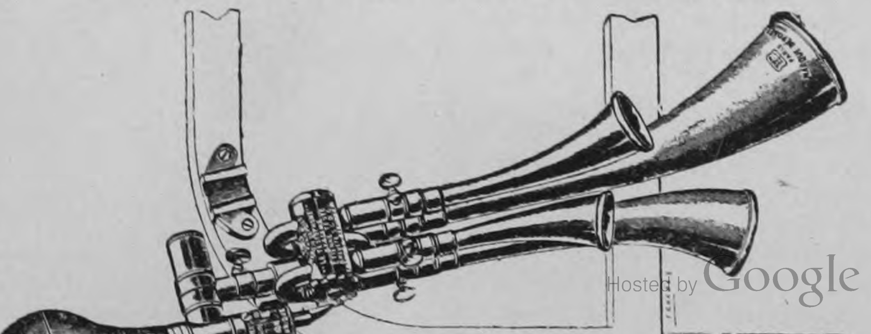
A removable bracket is furnished with the horn allowing it to be detached from the car for safe-keeping when it is not in use. It is made of brass only, 26 inches long and lists at $22.00.

The American Stepney Spare Wheel Co., of 1773 Broadway, New York City, is now acting as the sole United States agent for the distribution of Stepney Spare Wheels manufactured by the Spare Motor Wheel of America, Ltd., at St. Anne, Ill. This factory is also manufacturing a complete line of motor and motorcycle rims.

The Sterling Machine & Stamping Company announce the removal of their plant from Vermilion, Ohio, to Wellington, Ohio.

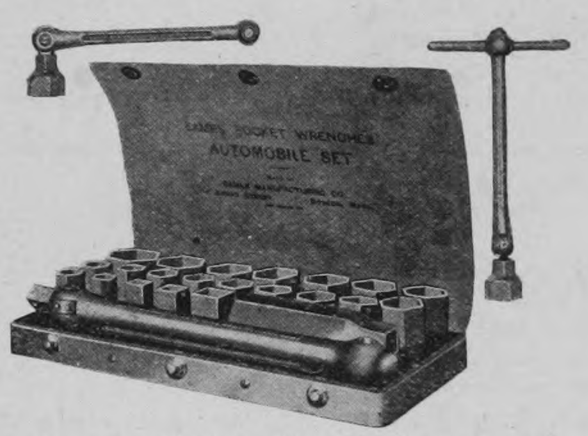
This new factory affords larger quarters for the increased business and will provide ample facilities for promoting their line of special manufacturing, sheet metal stampings and pressed steel parts.

This company also manufactures gas generators, tire lugs and many other accessories for the automobile and in conjunction operates a stamping department, an electro plating department and a brass foundry, constituting the full equipment for the production of articles complete, ready for the market.



The accompanying cut shows a socket wrench outfit designed specially for automobile use by the Eames Manufacturing Company, 44-46 Broad street, Boston, Mass.

The cut shows the complete set in its case and also shows the handle in its two extreme positions. For use on nuts at difficult angles or in not readily accessible



The "Eames" Socket Wrenches Automobile Set.

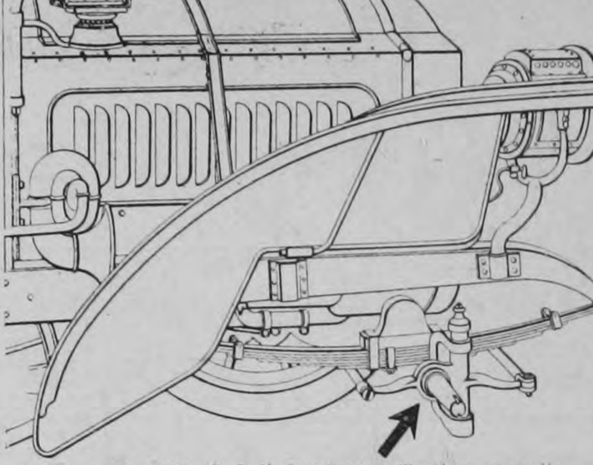
places, the handle may be turned about the swivel joint to the most convenient angle where it will automatically lock. It is simple, rigid, of universal application and can be operated with one hand. The handle is made of two steel drop forgings, properly machined and joined together.

The cross-bar or tee attachment is also steel and can be slipped readily into its place in the main handle but cannot slip out of its own accord. The sockets are graded to cover all the sizes of hex and square nuts and cap screws used on automobiles. Twenty-two sockets are furnished including one special long socket, for spark plug. The sockets are pressed steel thoroughly annealed after the last drawing which insures great strength and freedom from brittleness. The sockets are held in place on the handle when in use by an efficient friction grip.

Special attention is called to the construction of the case. The bottom is seasoned basswood, substantially bound with brass. The cover is a sheet of heavy oak tanned leather. The sockets and handles cannot fall or be shaken out and cannot rattle against each other. The set complete weighs 5 pounds and lists at $9.00.

THE "B. & L." TRAILING SPINDLE

The "B. & L." front axle Trailing Spindle, illustrated herewith, is manufactured by the Queen Manufacturing Co., of Webster City, Iowa. It is designed for the purpose of making steering easier and preventing an accident in case the connect-



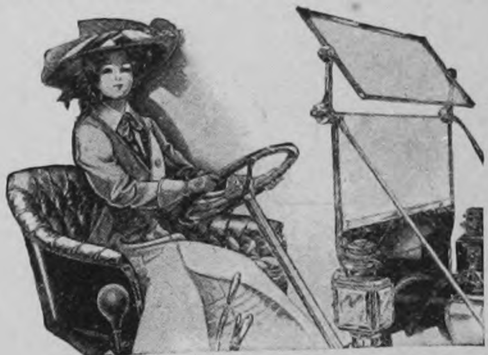
The "B. & L." front axle Trailing Spindle.

spindle 2½ inches back of the yoke whic the makers claim is scientifically correc as the wheel must follow (or trail) fro the axle in the same direction which th car is headed. There is no change wha ever in the yoke.

In case of an accident to the connectin rods to the steering post or between th two wheels and they break or becom loose, it is claimed the wheels will tra and allow the car to travel straight ahea far enough to be stopped before there any danger. One front wheel can be d connected from the other and it will tra it is claimed allowing the car to be drive around corners or in fact in any directio It is also claimed that the car may driven through sand or mud from 2 to inches deep at 25 or 30 miles per ho without touching the steering wheel.

THE "TROY" AUTOMATIC WINDSHIELD

This windshield is entirely automatic its action and the upper sash will lock self no matter in what position it is se All the mechanism of the shield is conce



The "Troy" Automatic Windshield. Model Ten; Posit for Rain View.

ed. Crucible steel spiral springs in t fixtures keep the parts in contact alwa on a tension, thus making it a "no rattler."

This shield either stands straight

The Bowden Patent Wire Mechanism

For the Transmission of Reciprocating Motion Through a Flexible and Tortuous Route

THE Bowden Wire Mechanism is particularly adapted for Motor Car, Motor Cycle, Motor Boat and Airship service, as follows: For

Brakes for Cycles, Motor Cycles. Brakes for Motor Cars, Light or Heavy. Valve Lifters for Motor Cycles. Ignition and Throttle Controls for Motor Cars, Motor Cycles, Motor Boats and Airships. Carbureter Ticklers. Sprags for Motor Cars. Muffler Cut-outs for Motor Cars, Motor Cycles, Motor Boats and Airships. Auxiliary Air Controls for Motor Cars, etc. Solarclipse Gas Lamp Shades.

What it is.—The Bowden Wire Mechanism consists of but two parts—a closely coiled and practically incompressible spiral wire, constituting what is termed "the outer member," and a wire cable, practically inextensible, threaded through the above, and termed "the inner member."

What it does.—Previous to the introduction of the Bowden Mechanism the usual mechanical method of transmitting power in other than a straight line was by means of angle levers and rods, cables and pulleys, and other such devices, all of which necessarily involve considerable complication, besides increased labor and expense in adapting them satisfactorily to the user's requirements. The Bowden Wire Mechanism dispenses with all these difficulties, while enabling power to be transmitted by the most tortuous route. The mechanism is complete in itself, and requires only that one member shall be anchored to a stop at each end, and that the other member shall be attached to an operating lever at one end and to the object to be moved at the other.

¶ The opportunities for the use of the Bowden Wire Mechanism are practically unlimited, and in every case its employment is accompanied by decreased cost of actuating mechanism, simplicity, instantaneous operation of actuated parts (due to absolute lack of lost motion) and reliability.

¶ The Bowden Wire Mechanism may be adapted to impart either a **pulling** or **pushing** movement.

Over Two Million Feet Sold Annually

J. S. BRETZ COMPANY

Sole Importers, TIMES BUILDING, NEW YORK

Also U. & H. The Master Magnetos; F. & S. Ball Bearings; Hartford Universal Joints; German Steel Balls

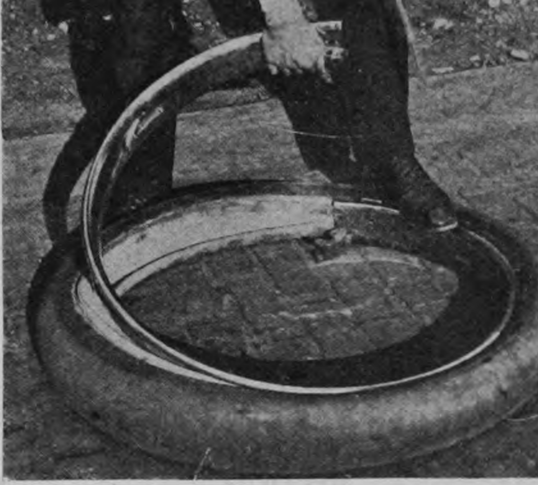
front seats of the car. There are several other adjustments giving any number of positions, each of which has its special advantages.

The Troy shields are made of brass and are guaranteed to pass any steering wheel. They are manufactured by the Troy Carriage Sunshade Co., of Troy, Ohio, and the style illustrated lists at $50.00.

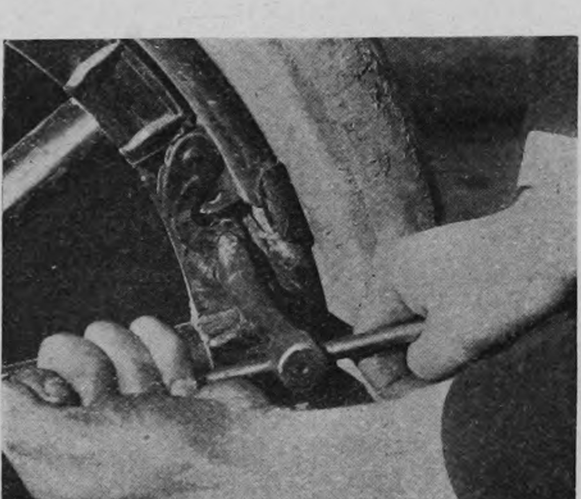
THE UNIVERSAL DEMOUNTABLE RIM

A brand new demountable rim of conspicuous merit which is just being placed on the market in Chicago is the Universal Demountable Rim, made by the Universal Rim Co., a $100,000 corporation, with general sales offices at 1467-1469 Michigan avenue, Chicago. This rim is of that type which is held in place by the constricting principle, the rim being an ordinary standard tire rim cut through at one point so that it can be expanded or contracted, according as to whether it is desired to remove it or to secure it in place. The details of construction, which are very clearly shown in the accompanying illustrations, are exceedingly simple, involving only two peculiarly formed lugs secured integrally to the ends of the rim and adapted to be thrown apart or drawn together by a single link of peculiar form, operated by the very simple two-pronged special tool illustrated herewith. The device locks automatically when in position, end thrust tending to separate the two ends of the rim having the effect of tightening rather than of loosening the hook-shaped link end. A small strip of light sheet copper or brass, bent to conform to the rim section, prevents the inner tube from blowing through the opening.

The necessary conversion of the wheel involves only the fitment to the felly of a plain steel band, provided with four lugs that engage corresponding recesses in rim and thus prevent creeping or lat displacement. At the point where two ends of the rim come together felly is cut away on one side to admit clamping mechanism. A steel plate bo opposite the cut-away place makes up the strength lost. It is a rather intering fact, first ascertained with scien correctness by the Universal Rim peo that an inflated tire on a divided rim the type used may exert a constriction to inflation alone of as much as 10 pounds. This of course affords added curity, tremendous force or the exceedly powerful leverage of the special being requisite to spring the rim ope

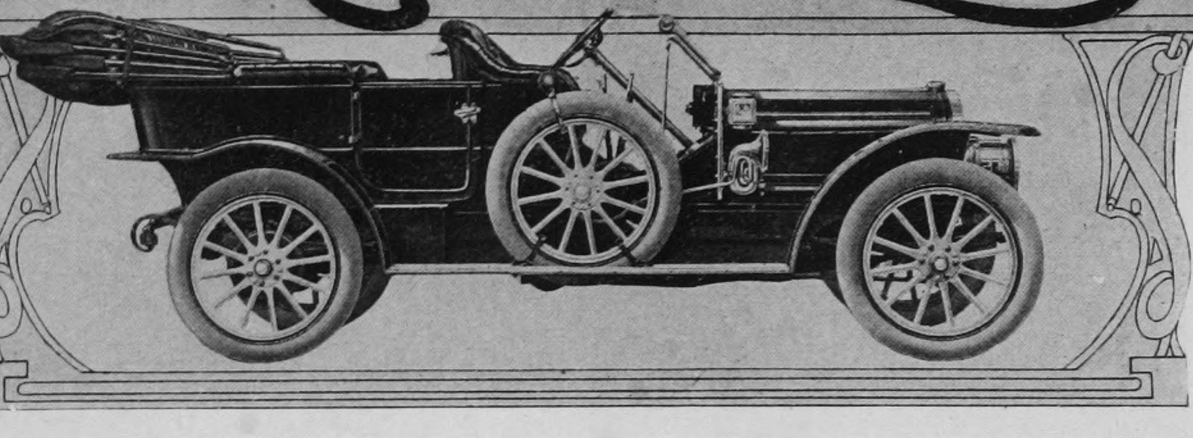


The "Universal" Demountable Rim; this view s how the rim is taken out of the tire.



Another point of advantage possessed the Universal Rim is that it facilit emplacement and removal of the t This is because the rim rather than tire is manipulated, the former being in and taken out by simply lapping ends and twisting it out as suggested one of the illustrations. This method not applicable to non-divided rims, even to divided rims that are sim forced open, without the linkages betw their ends being disconnected. Any t of tire can be used, but the quick-detaables are favored by the Universal peo because their use avoids the necessity lugs. It is planned to have this new on the market in large quantities in very near future and already several prinent automobile manufacturers are s to be figuring for the equipment of th entire output. The price is low, be only seventy-five dollars for compl equipment, including one extra rim the necessary remodeling of the whe

The Rambler Line



here are five models of the "New mbler" built by Thomas B. Jeffery Company, Kenosha, Wis., all based upon ee different chassis, all with four-cylin- engines, magnetos and 36 inch wheels.

Iodel Fifty-five, seven passenger tour- car $2,500, seven passenger limousine 750; Model Fifty-four, five passenger ring car or four passenger close coup- $2,250; and model Fifty-three, five pas- ger touring car $1,800.

n design and materials the engine, nsmission, drive shaft, axles, frame and eels, are alike for all three chassis. In se particulars they differ in size only.

hose individual Rambler features of the t such as the offset crank shaft, big eels, spare wheel, straight line drive l engine accessibility, are found in all ee chassis.

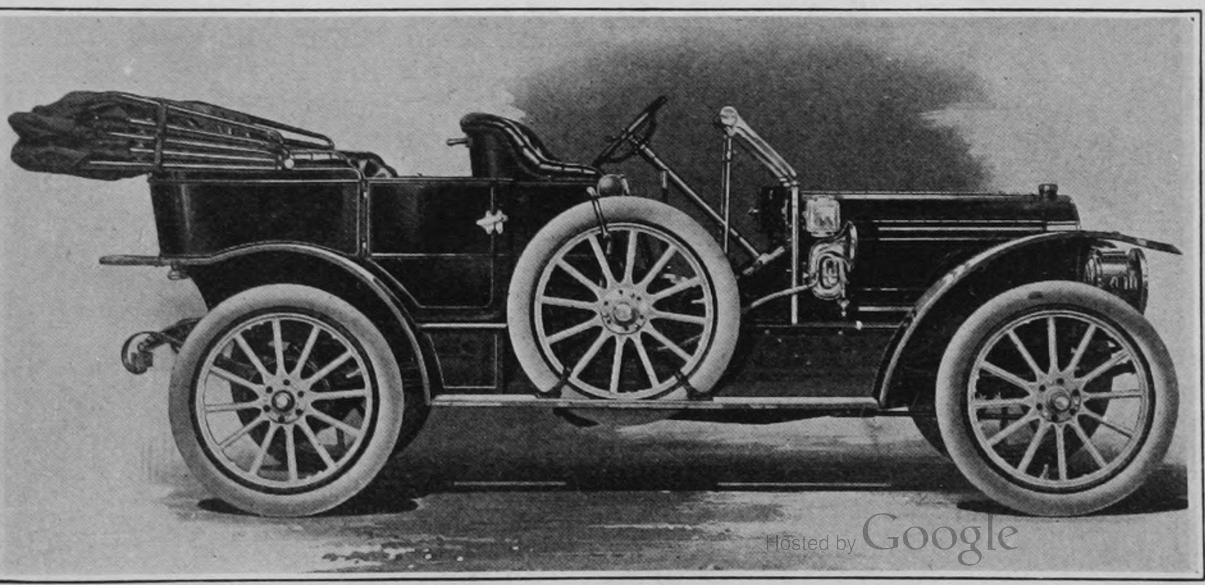
wo of the chassis which differ only in eel base and tire size have engines 5 by , which deliver 45 H. P.

Model Fifty-five, the seven passenger touring car, has a 45 H. P. engine, 123 inch wheel base, 36 inch wheels and 4½ inch tires. This model complete with magneto, gas lamps and Prest-O-Lite tank, electric side and tail lamps and 6-80 storage battery, sells at $2,500.

The same chassis with 5-inch tires is used for the seven passenger limousine.

Model Fifty-four is provided as a five-passenger touring car, or four passenger close coupled, and sells at $2,250, with the same equipment as provided on Model Fifty-five. It has the 45 H. P. engine, 117-inch wheel base, 36-inch wheels and 4-inch tires.

Model Fifty-three is another five passenger touring car. This is almost a duplicate of Model Forty-four of last year. The cylinders are 4½ by 4½ and deliver 34 H. P. This model with magneto and lamp equipment sells at $1,800.



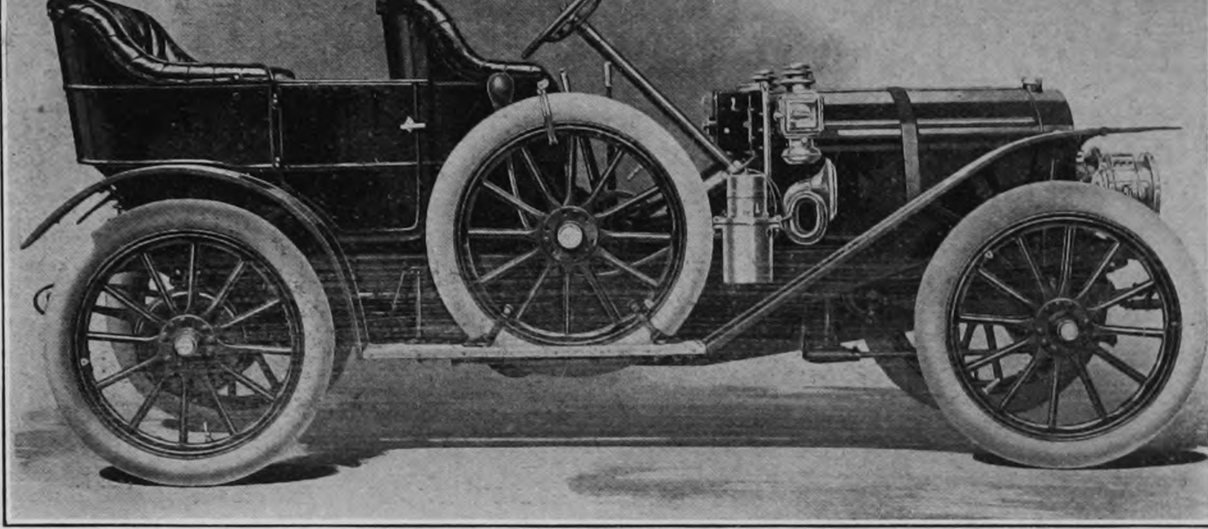


Fig. 2. The New Rambler Model 53. Motor 4-cylinders, 4½ square, 34 H. P. Magneto has regular equi ment; 6-40 battery and box $15 extra, 108-in. wheel base, 36 by 3½ tires and quick detachable rims, three spe **sliding gear** transmission of selective operation, passenger capacity, 5. Equipment, oil, side and tail lamps, g **head lights and generator**, horn, full set of tools and jack.

As the differences have been explained above the following dscription will apply to both Models Fifty-five and Fifty-four.

THE RAMBLER MOTOR.

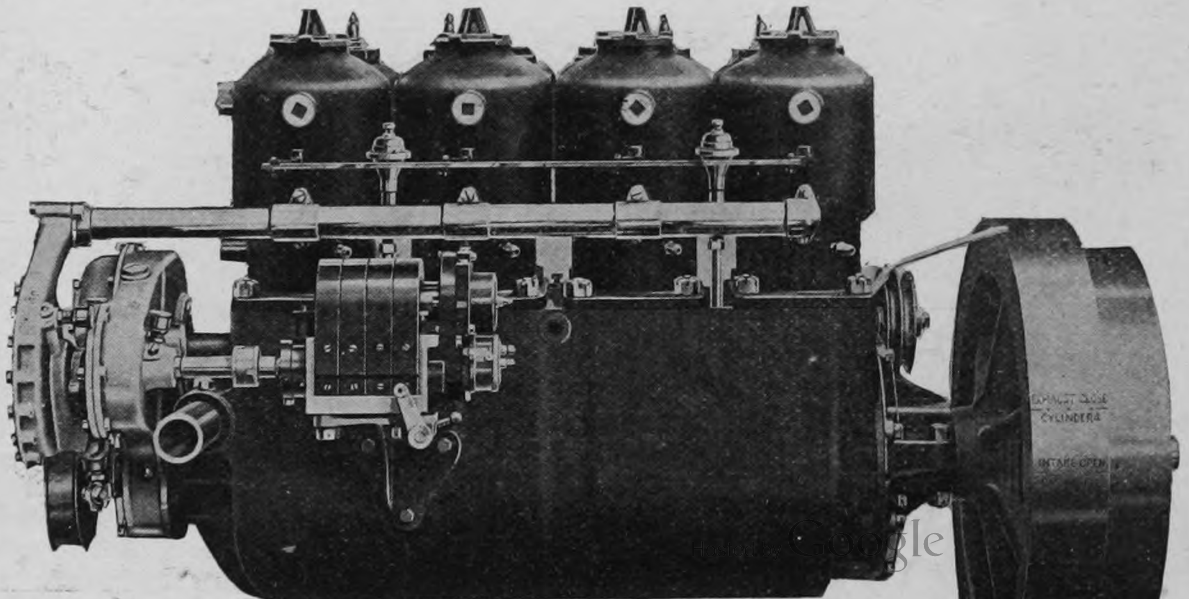
The engine, as the photograph shows, is of the same type that has been used in models Forty-four and Thirty-four Ramolers of the past two seasons. The valves overhang all on one side, and the crank shaft is offset 25 per cent. of the piston stroke. The crank case is of the barrel type with an opening 23 by 8 inches on the side for inspection and adjustment. A wedge type of bearing, adjustable from the side, as shown in Fig. 5, makes possible easier and more perfect adjustment from the side than can be accomplished by the bolt method.

In the 1910 model the pump has been moved to a position forward of the cam gear case. This change is to provide a more accessible magneto location. It now located on an extension of the pu shaft just back of the cam gears. It c be very easily reached for both inspecti and adjustment.

A combined shield and oil gutter tached to the crank case at the rear the fly-wheel end main bearing retur all surplus oil that may work through t bearing back to the crank case. Th eliminates the possibility of its droppi on to the fly-wheel and being thrown on the other mechanism.

THE EXPANDING CLUTCH.

In Models Fifty-five and Fifty-fo chassis the clutch has been changed fr the cone type to the internal expandi type. This eliminates end thrust on t crank shaft and its design is such that exerts the greatest pressure when fu



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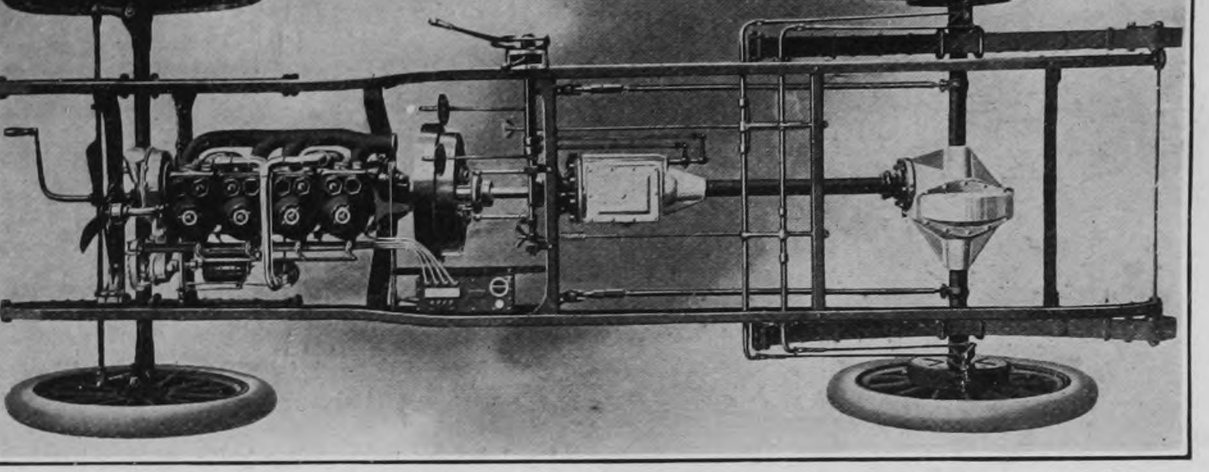
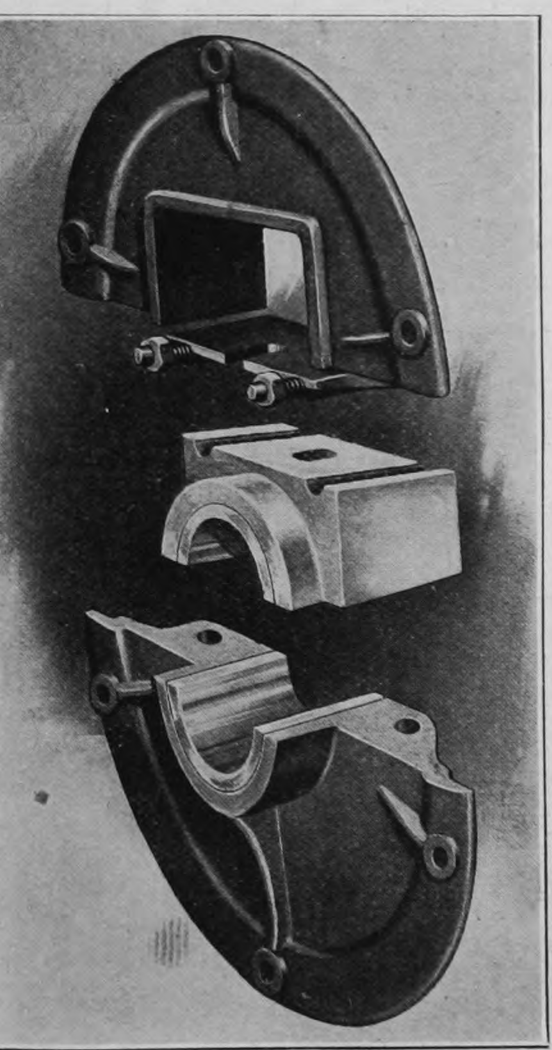


Fig. 4. Plan view of the Rambler 54 chassis showing clearly the method of mounting the 4-cylinder engine on
two cross frame members, the location of the multiple feed oiler and its belt drive from the cam shaft and
arrangement of the rear axle assembly, distance rods and change speed gear case and also the large scroll end
r springs.

aged. With the average clutch the
ing is expanded when the clutch is en-
ed so that it then exerts the least in-
ad of maximum pressure. This clutch
been very thoroughly tested and it is
med has been found to be ideal in
ration, that is, it engages very gradually, holds positively, and disengages instantly.



The only change in the transmission is at the roller bearing which carries the forward end of the main drive shaft. This is a hinged bearing with a dowel fastening, retained in a steel case and provided with adequate means to compensate for all end thrust.

The rear axle continues of the semi-floating type but the drive shafts are larger and a new method is used for securing the wheels. On the Rambler drive shafts the differential gear is upset on the end of the shaft, making the drive gear and axle integral. In the 1910 models the wheel end of the shaft is also upset. This enlarged end is squared and tapered for the forged wheel hub. This method of upsetting or enlarging the shaft before squaring it, makes it strongest at this point, whereas otherwise the metal removed by squaring would weaken it.

The springs are of the triple action type, but somewhat modified in design from those of last year. They are straighter and the second leaf is longer, extending into the bend of the top leaf so as to support it.

The screw and nut type of steering gear has ben retained but the nut has been lengthened to increase the wearing surface, and a ball thrust bearing has been added with better provision for adjustment.

A neat pressed steel bracket supports the bonnet at the dash. The strap is done away with and the bonnet is held down by convenient spring clamps. Particular attention has been paid to the guards; they are wider, heavier, better braced, convexed to strengthen them and improve the appearance, and their outline is much

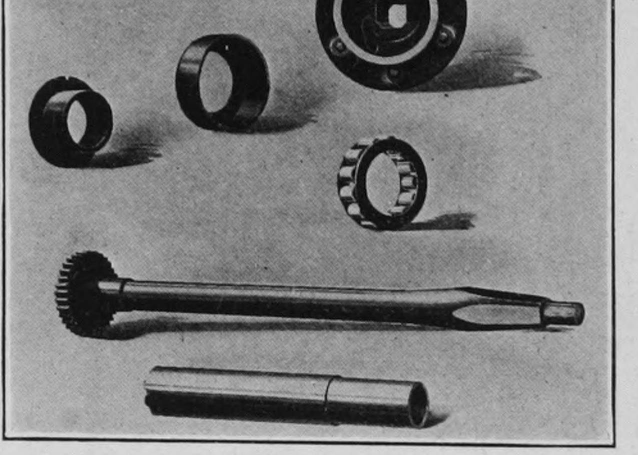


Fig. 6. Rear axle shaft roller bearing sleeve and case as used in models fifty-five, fifty-four and fifty-three for 1910. The differential gear is made integral with the shaft, the outer end of the shaft is enlarged by upsetting and taper squaring to take the forged wheel hub. By enlarging the shaft at this point it is not weakened when squared.

A neat filler strip projects from nearly the top of the frame to the running board, entirely covering the running board supports. Four of these supports are provided for the larger and wider running board now used. This board is aluminum covered.

BODY CHANGES.

The changes in the bodies apply alike to both models. The most important change is the lowering of the seats. This adds to the comfort of the passengers and improves the appearance. More room is provided between the front seat and the pedals.

The tonneau floor is counter sunk between the frame channels, providing plenple room is provided to pass between two extra chairs when occupied. Th bodies are very richly upholstered v hand-buffed leather, curled hair and c springs. Deeper springs and more better hair are used than heretofore, a ing greatly to the riding qualities.

Although Model Fifty-three is a sm er car, it can hardly be called a small particularly in power. With 4½ by cylinders the engine delivers 34 actua P. by dynamometer test. The perfo ance of this model is even better than predecessors, because the car otherv is somewhat smaller and lighter. wheel base is 108 inches; the wheels inches, with front tires 3½ inches rear tires 4 inches if desired, at $20 tra.

The description of Models Fifty- and Fifty-four, relating to the pump magneto locations, the oil shield and ter, transmission bearing and rear a apply also to this model.

Practically the only other import change from its predecessor is in the springs. They are the full elliptic t with involute ends. These springs h been used for two seasons on other R bler models, and have so thoroug demonstrated qualities of unusual c fort as to warrant their adoption for model.

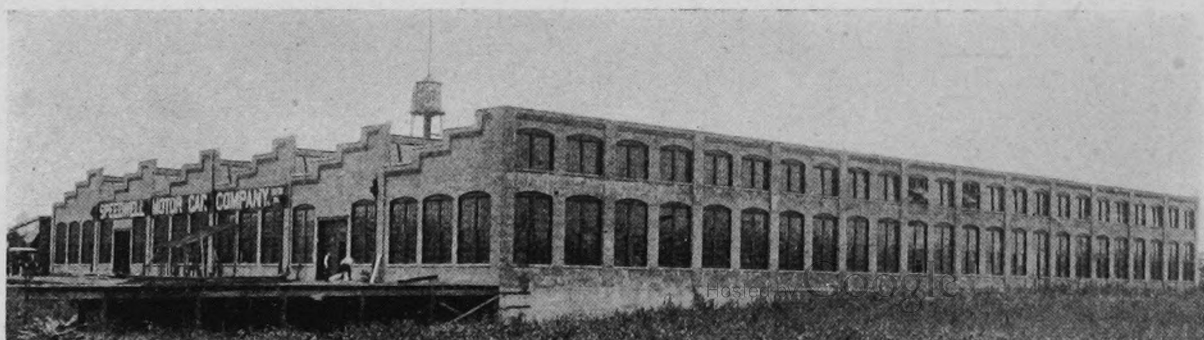
Model Fifty-three is so nearly like predecessors, Model Forty-four and T ty-four, that a detailed description is necessary.

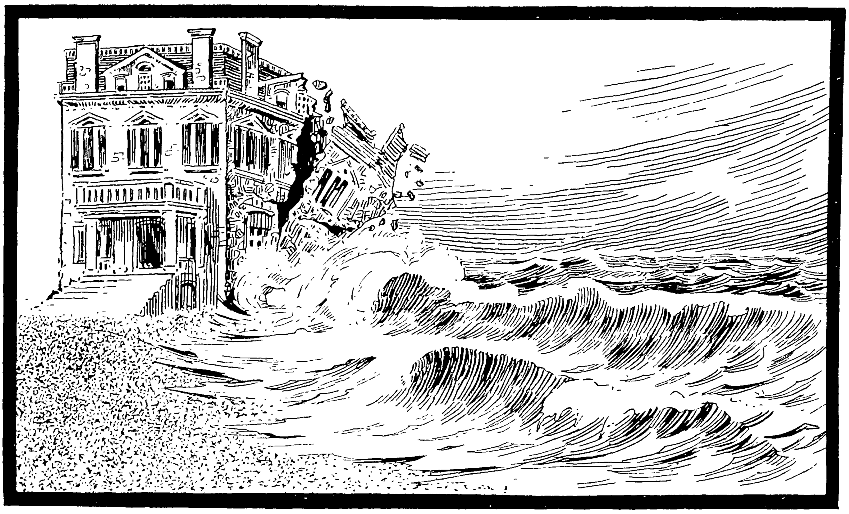
The Detroit Seamless Steel Tubes Co., Detroit, Mich., is now erecting a large addition to their factory, and installing additional equipment which will increase their capacity about 30 per cent.

General Motors Co. Increases Capital—The General Motors Company, which now controls about twelve companies, recently increased its capital stock from five million five hundred thousand dollars to forty million dollars.

H. C. Henderson, who has been conn ed with the Thomas factory, Buffalo, N York, for a number of years, has joi the selling forces of the E. R. Tho Motor-Branch Company in Boston. has the best wishes of many old cu mers and factory employees who kn him as "modest Barney."

The Union Machine Works, 1411 No Tenth street, St. Louis, Mo., have been pointed general sales agents for the " derson" engine in St. Louis and vicinity





Would It Pay You to Build Your House on Sand?

Hardly, unless you have acquired a taste for throwing away your money.

The bearings of a machine are its foundation, and the owner who doesn't insist on the best alloy for his new bearings is in the same class with the man who builds his house on a sand bank. Inferior bearing metal will have to be replaced in a short time and the owner will have to stand all the expense over again.

More cars are ruined by the installation of cheap inferior alloys than by any other cause.

The average bronze bearing metal is so coarse in structure that it is bound to flake off and cause untold damage to your car. If it is a soft bearing metal like the babbitts, it melts at a low temperature and the entire motor is thrown out of alignment.

Don't let the repairman stick any alloy he may have on hand into your car.

Insist on NON-GRAN High Speed No. 8 Bronze. NON-GRAN Bronze will cost him more, it is true; but you are paying for a good job, and why not get one?

We will send you testimonials from the leading motor car, motor boat and other high speed motor manufacturers, which will prove to your perfect satisfaction that we manufacture the best bearing alloy on the market.

All first class repair shops keep on hand a stock of NON GRAN in Cored-Bars. If your repairman is not stocked with NON-GRAN Bronze we should be pleased to serve you direct, or, better still, send us his name.

American Bronze Co., Berwyn, Pa.

WARNING

We are the owners of patent No. 741,684, filed February 6th, 1902, and granted October 20th, 1903, which broadly covers a Spark Plug, provided with a CAP on the end thereof, having a perforation, the insulating core extending into said CAP, provided with a chamber or recess around the electrode for the purpose of preventing an injurious accumulation of soot or other foul matter on the insulation of the Electrode.

We have commenced a suit in the UNITED STATES CIRCUIT COURT, Southern District of New York, in this City, against A. R. MOSLER & CO., for infringements of this patent, notice of infringement having been served on them as early as January, 1908.

The Canfield patent No. 612,701, granted October 18th, 1898, in our opinion, is not worth the paper it is written on and does *not* cover our construction nor will any decision for or against the validity of this Canfield patent, give the recent purchaser, A. R. MOSLER & CO., or any other licensee under this patent, the right to manufacture, sell or use a Plug covered by the Lehman patent.

Papers are now being prepared for the commencement of suits in equity against other infringers, as it is our intention to protect our exclusive rights under this patent.

Every party who manufactures, sells or uses such SPARK PLUGS, not manufactured by us, will be liable as an infringer and subject to a suit in equity for an injunction, accounting and damages.

J. H. LEHMAN MFG. CO.

500 Fifth Avenue, New York City

The Peerless models for the coming sea-
n are three in number and embody very
w changes over those of 1909. The en-
e growth to the present Peerless cars
s been a gradual one, each improvement
ing thoroughly tested before becoming a
rt of the design. Since 1906 each sea-
n's output has been but a carefully re-
sed and refined continuation of the pre-
ous models.

All the essential parts are manufactur-
in the company's own works under a
stem of most rigid inspection. Each sea-
n new buildings and equipment have
en added to the Peerless Motor Car
's plant, at Cleveland, Ohio, until the
sent group of buildings aggregate in
or space over 8 acres.

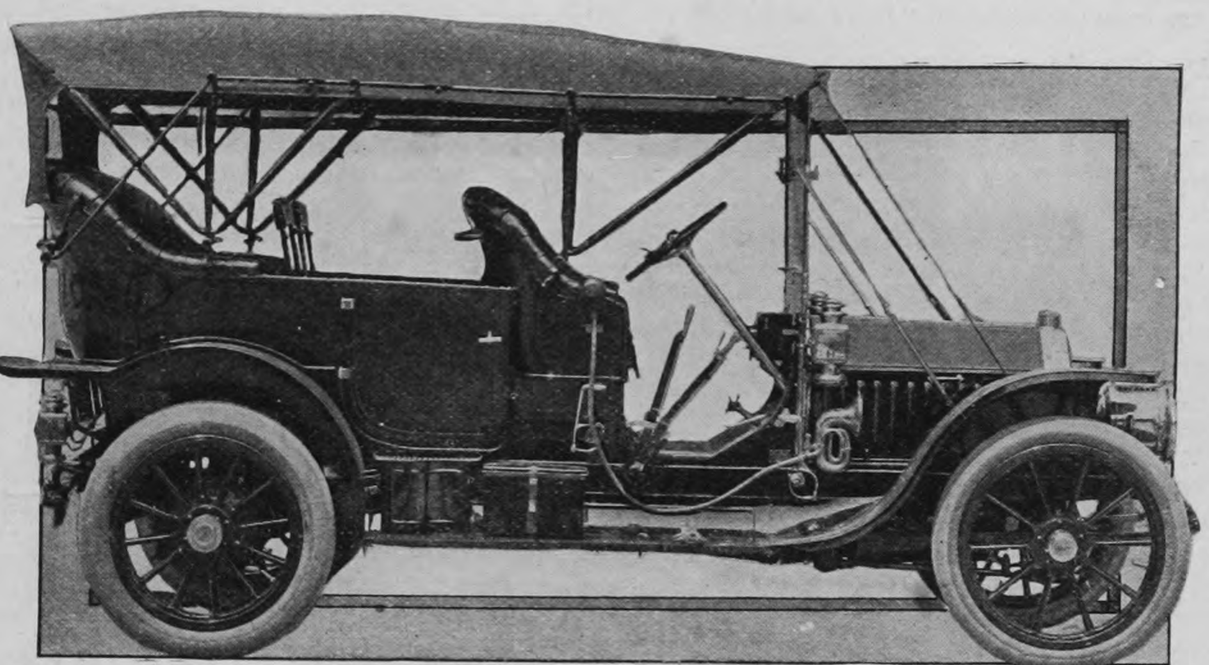


Fig. 1. Peerless Model 27-38 H. P. A. L. A. M. rating. This 4-cylinder car is known as a 30 H. P.
odel, although the A. L. A. M. rating is higher. As a touring car with top, price is $4475, chassis is $3800.
linders are 4⅞ by 5½, wheel base 122 in.; tires 36 by 4 in. front, 36 by 5 in. rear. Self contained lubricating
stem, double ignition system, or two separate and distinct methods, including two sets of plugs. Four
eeds forward and one reverse, selective sliding gear.

Briefly, the models are known as 27, 28
l 29, the 4-cylinder 27, rated as 30 H.
the A. L. A. M. rating being, however, 38
P., cylinders 4⅞ by 5½ and the wheel
e 122 inches, while the tires are 36 by 4
the front and 36 by 5 on the rear.
s model is put out as a roadster with
same general chassis specification with
exception of the wheel base which is
½ inches. The model 28 is a 6-cylinder
chine of 4⅞ by 5½ inches, conservative-
rated as 50 H. P., its A. L. A. M. rating
ng 57 H. P. The wheel base is 136
hes and the tires 36 by 4 on the front
36 by 5 on the rear. The roadster of
type has 132½ inches wheel base, 36
being 25. The wheel base is 130 inches and the wheels are fitted with 32 by 3½ inch tires. The 4-cylinder model 27 is fitted with various bodies ranging from the touring car at $4,300 up to the landaulet at $5,800. The regular chassis sells for $3,800. The 28 6-cylinder model also is fitted with a complete line of bodies, the prices ranging from $6,000 to $7,300 for the landaulet. The small model 29, either as a town car limousine or a town car landaulet, sells for $4,500.

The standard colors for the season of 1910 are maroon for the bodies of the touring cars and roadsters and Coach Painters' Red for the running gear, while the limousine and landaulets are finished with either red or blue, and are upholstered in imported broadcloth or with cloths of goat skin. For equipment, the usual head lights, extra large Prest-O-Lite tank, side and tail lamps are supplied and also a complete set of tools in a specially constructed box on the running board which also carries the Prest-O-Lite tank concealed.

THE MOTORS.

The two larger models, one of four cylinders and the other of six cylinders, use the same cylinder castings, these cylinders being 4⅞ bore and 5½ inch stroke. The water jackets are ample and carry a larger supply at the top than at the bottom, thus making uniform as near as possible

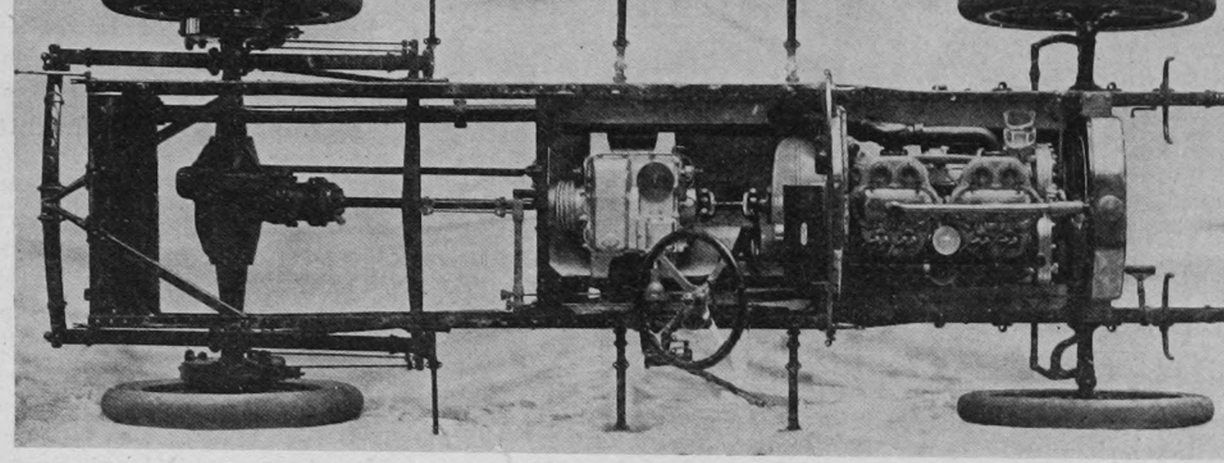
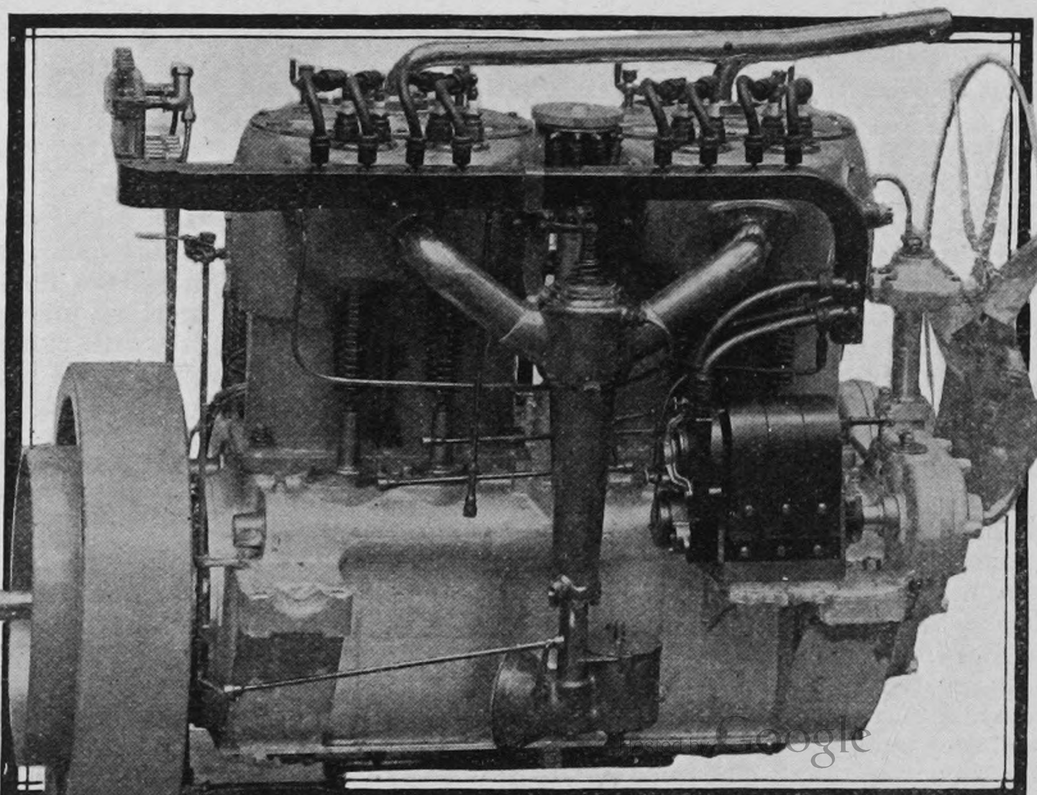


Fig. 2. Plan view of the Peerless 1910 chassis. This view shows the complete protection of the motor change speed gears, connecting links, etc., by means of an under pan, also the well braced frame, the br eveners, the rear axle and differential housing and the method of carrying the rear cross spring.

the removal of core sand. This radiator is of the Peerless design, a patented construction used on the 1909 models, which, it is claimed, will cool the motor under the most trying circumstances. The circulation of the water is maintained by a gear driven herring bone gear pump which gives a constant and positive flow, forcing the water through the large cylinder jacks into the top of the radiator. This pump is noiseless in operation.

The crank case is a one-piece aluminum casting ribbed to give additional strength. Its dimensions have been somewhat increased this season and thus provides for an increased oil supply. The connecting rods and bearings are made access through hand hole plates in the bottom the case, these plates being fitted wit patented pocket or groove at the low point into which the dirt and sediment fr the oil deposits. The valves are made imported alloyed steel and tapered sea The crank shaft is a one piece heat trea drop forging, ground accurately to finis size.

Careful attention is given to the bala ing of the reciprocating parts and it claimed that all connecting rods and tons are finished to approximately same weight. The fly-wheels are ca fully balanced in a special rotary test



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d run in oil.

CARBURETOR.

A new carburetor embodying several imrtant improvements is used on the odels 27 and 28, the float chamber is wered sufficiently so that the gasoline is pplied by gravity feed on any angle to hich it is likely the car will be tipped in scending the steepest grades. This caruretor is of course automatic in its operaon. The throttle valve is a single seatd one, vertically operated, providing a uniorm mixture. This throttle is controlled y a hand lever on the steering wheel and lso by an accelerator pedal and also by a overning device of extreme sensitiveness. ll the connecting links for operating the hrottle are fitted with ball and socket nds which allow for adjustment to comensate for wear, thus practically elimining back lash.

THE IGNITION.

These cars are fitted not only with a ual ignition system but each is absoutely independent of the other even to the ase of two sets of plugs, or in other words he timer, spark coil and battery may be

designing the oil reservoir is cast as an integral part of the crank case and has a capacity of about one gallon. This compartment contains a mechanical pump which forces the oil through sight feeds on the dash to the cylinders, crank case compartments and to the fan bearing. Splash is used in the crank case, the proper level being maintained by drain cocks fitted at the lower ends of short stand pipes. These drain cocks are all simultaneously operated by a thumb screw located accessibly beside the oil reservoir. A hand pump is also fitted for giving an additional supply of oil to the crank case whenever it is desired. The integral construction of this oil tank prevents leaking.

A very simple and accessible clutch of the internal expanding band type is employed which is light in weight, balanced and is claimed, stops rotating as soon as disengaged and engages very smoothly. Another feature of advantage is the ease with which it may be adjusted to compensate for wear. Between the clutch and transmission is a short alloy steel shaft, the ends of which are forked and fit in the

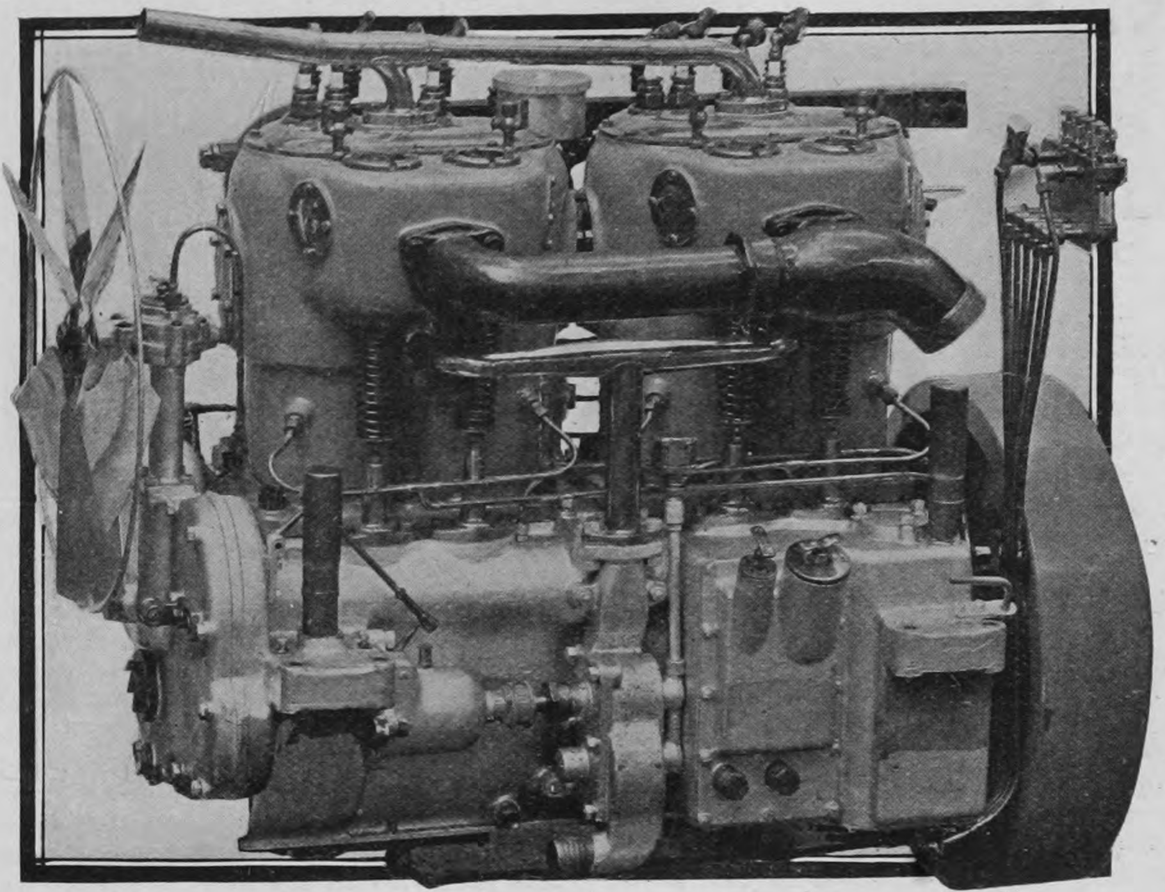


Fig. 4. Exhaust side of the Peerless 1910 motor showing the oil reservoir cast integral with the crank case. Oil is forced by pumps through the sight feeds at the rear, which are placed on the dash. The hand pump is arranged to supply additional oil to the crank case compartments and the pet cocks on the overflow pipes from these compartments can be simultaneously opened by means of the small handle shown at the left of the hand pump. Attention is called to the breathing tubes at each end of the crank case and also to the method of mounting the fan on a pedestal and positively driving the same by gears.

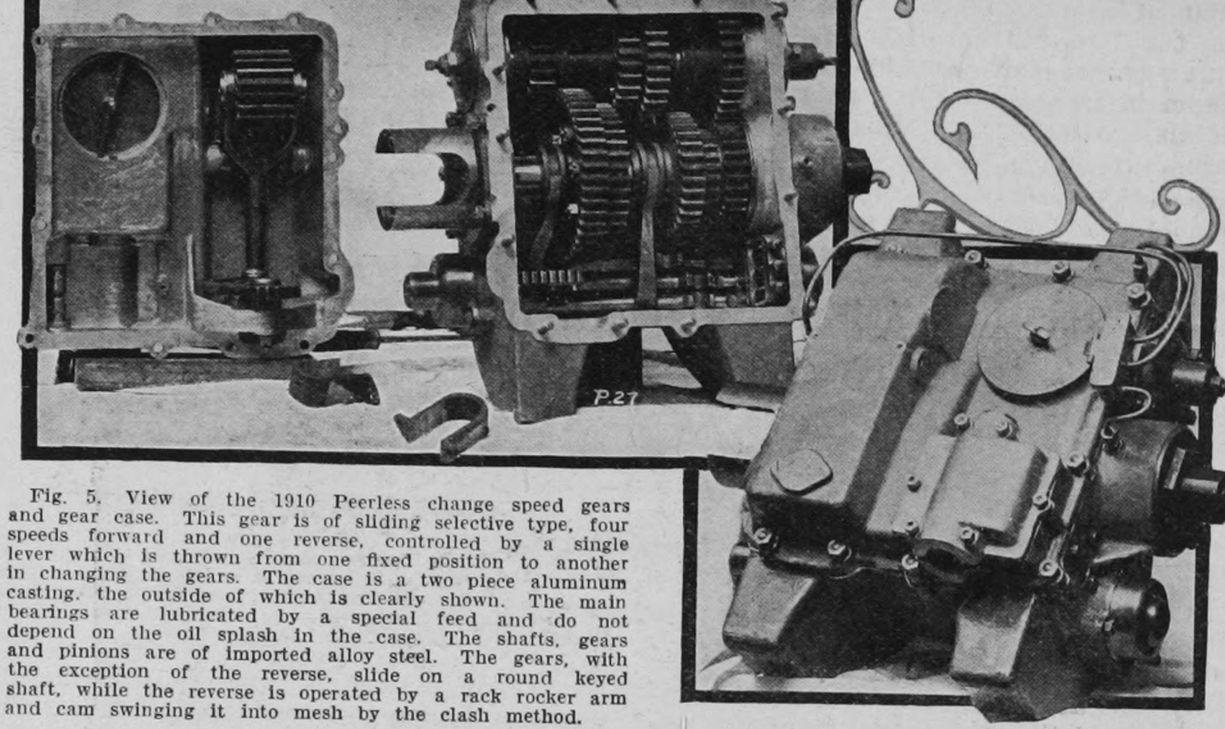


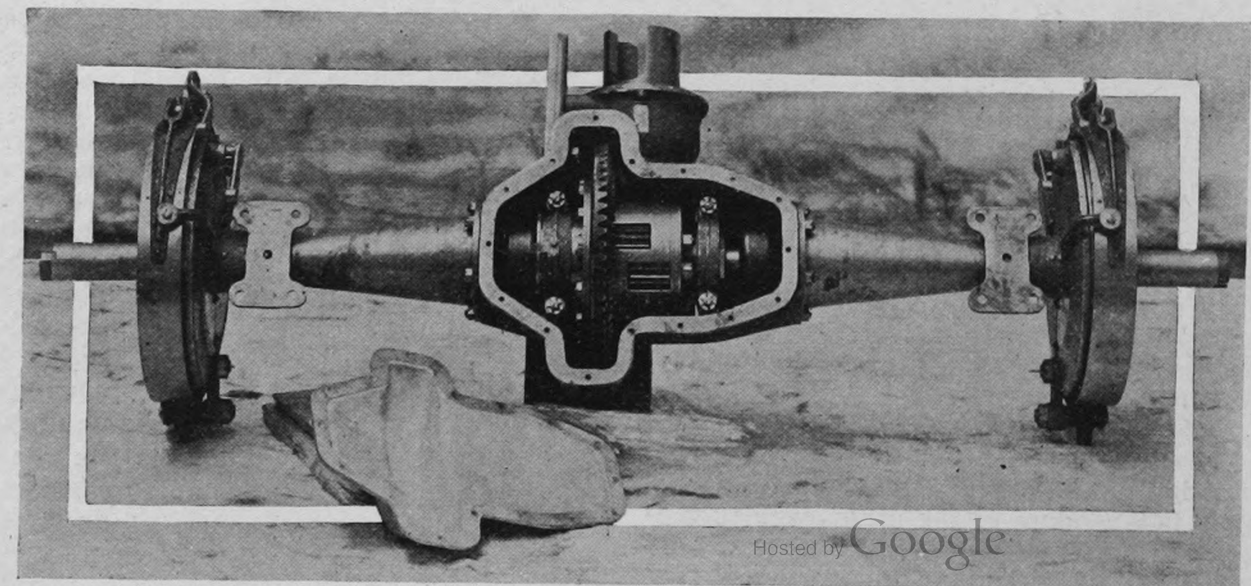
Fig. 5. View of the 1910 Peerless change speed gears and gear case. This gear is of sliding selective type, four speeds forward and one reverse, controlled by a single lever which is thrown from one fixed position to another in changing the gears. The case is a two piece aluminum casting, the outside of which is clearly shown. The main bearings are lubricated by a special feed and do not depend on the oil splash in the case. The shafts, gears and pinions are of imported alloy steel. The gears, with the exception of the reverse, slide on a round keyed shaft, while the reverse is operated by a rack rocker arm and cam swinging it into mesh by the clash method.

sible to quickly remove either the clutch or transmission without disturbing the other.

CHANGE SPEED MECHANISM.

Gear changing is effected by a single side lever which controls a sliding gear of selective type giving four speeds forward and one reverse. The gear quadrant is so arranged that the operating lever is thrown from one fixed position to another, making the operation simple and one that can be done with confidence even by a comparative beginner. The change gear case is an aluminum casting and made in two parts, the base containing the transmission shaft, counter shaft and gears and the shifting bars and levers and also carrying the mechanism which locks the gears while in mesh. The clash gear for the reverse pivoted in the upper part. All the operati parts are enclosed within the case a strength is maintained by making the pa ing line of the case above the centre line the bearings. The shafts and gears are imported alloy steel, the sliding membe operating on a round keyed shaft.

By shifting the change speed gear ca slightly forward on the sub-frame it h become possible to change the position the gear shift and brake lever quadrant that these levers are now in a more vert cal position and within easier reach of th operator than in previous models. Althou the change gears operate in an oil bat this oil does not lubricate the main bea

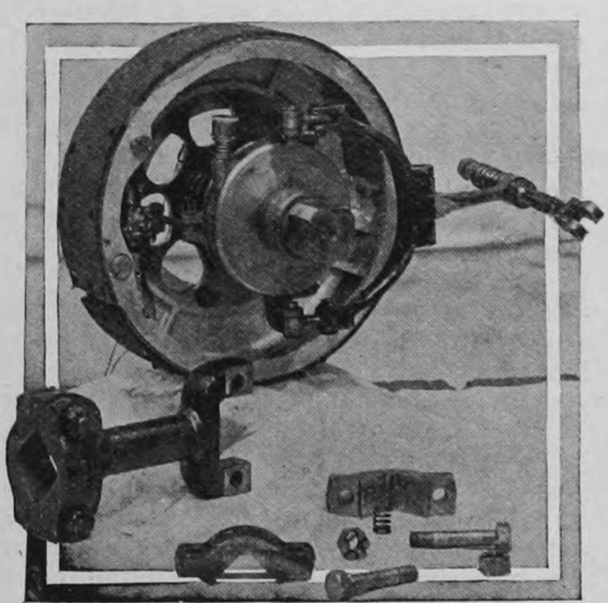


front of a transmission case directly under the foot boards. An inspection cap with bayonet lock provides easy access to the main portion of the transmission case for inspuection or for filling with lubricant.

The drive to the rear axle is by means of a propeller shaft fitted with universal joints at each end. This shaft has been slightly lengthened owing to the further forward position of the change speed case and thus gives more nearly a straight line drive. The universal joints are of the cross type, are fitted with roller bearings, and are protected from dust and dirt by telescoping leather dust shields. The torque rod instead of being of steel tubing is of pressed steel of channel section. Its forward end is supported by cushion springs enclosed in a neat tubular casing attached to a cross frame member.

SPECIAL REAR AXLE CONSTRUCTION.

The weight of the rear of the car, with its proportionate load, is carried by a rear axle, consisting of three members only; the cast steel differential case being bolted on either end to flanges of the one-piece, heavy gauge steel axle tubes, which carry at their outer extremities the road wheels. These axle tubes are flared from the spring saddle toward the cast steel differential housing thus giving the axle as a whole, the greatest possible rigidity and strength, due to the constantly increasing diameter of the tubes from either end toward the center. The power is transmitted by means of bevel gears, differential and live axle shafts operating clutch plates engaging with the wheel hubs. On each side of the driving gears and connecting with the live axle are improved universal connections.



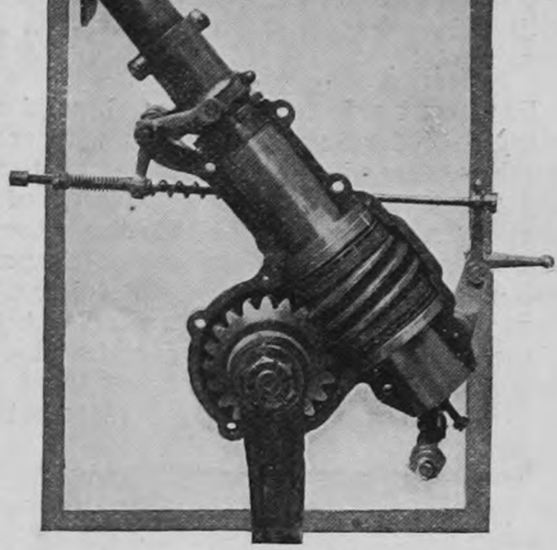


Fig. 8. View of the Peerless 1910 steering gear, wh is of the worm and gear type, the gear being a comp wheel forged integral with the shaft, insuring g strength and wearing surface. Above and below the w are self-adjusting thrust bearings.

These cardan or universal joints allo an arched axle construction and cons quent camber or dishing of the rear whee a valuable mechanical feature which al give the cars a distinctive appearanc The cardan joints are somewhat like positive gear clutch, the end of the ax proper having jaws similar to a spur ge and meshing with another jaw clut shaped like an internal gear, on the di ferential. These jaws are of a peculi shape to allow for universal action.

On account of the greatly increased nur ber of engaging points over the ordinar clutch, there being 14, the universal actio is more uniform, the wearing quality greatly improved because of the fact th the driving or engaging faces are at much greater distance from the center the shaft than in previous types. The are made of imported alloy steel special treated.

The housing containing the bevel ge mechanism is a steel casting split 2¼ incl es above the center line, instead of exact in the center line as formerly; therefor the casting being deeper is of greate strength and rigidity.

Distance rods are attached to both fran and rear axle by ball and socket joints o either side and are adjustable. The c is propelled through these distance ro and not through the springs. This d vice together with the torque rod reliev the rear spring from all duty except th of support of the body with its load.

STEERING.

The steering mechanism is of the wo

thrust bearings of special imported type are placed above and below the worm. An 18-inch hand steering wheel is used on both new models.

THE AXLES.

The front axle is an imported, solid one-piece drop forging, of I section with spring saddles forged integral. The center of the front axle is the lowest point of the car. The pivot point of the steering knuckles is supported on special imported ball bearings of large size and roller bearings are used on the front wheels. A one-piece connecting rod between the steering knuckles is located behind the front axle so that it is guarded from all road obstruction.

The springs are imported from Lemoine of France, and are made of an alloy steel known as silico manganese. The front springs are two inches and the rear side springs four inches longer than those of the 1909 car, both sets being nearly flat, highly polished and very resilient. The two rear springs are attached in front to the frame and in the rear to a platform spring, attached to the center of the rear cross member of the frame, thus making a three point spring suspension. This method of rear spring suspension in combination with the drop frame, the curvature and the quality of springs gives a high degree of perfection in riding qualities.

FRAME.

The frame is cold rolled pressed steel of truss pattern, with a subframe on which the engine and transmission are carried. The drop frame adopted some years ago is a feature of great importance, since the center of gravity of the car and load, is nearer the ground and yet does not interfere with the road clearance. The drop frame gives a low center of gravity and the car may be handled more easily and safely at high speeds over rough roads.

WHEELS.

Thirty-six inch wheels, artillery type with dished spokes, are used both front and rear. The dished spoke construction best withstands any side strains and is stronger than the ordinary straight spoke construction. Thirty-six inch by four inch tires are used in front and thirty-six by five inch tires on the rear.

Both the front and rear fenders have been designed for greater attractiveness and to insure better protection to the car and its occupants. The front fenders are flat and are fitted with a wing which extends from the inner side of the fender to the frame and a metal fender between frame and running board prevents dust from coming into the car, hides the step brackets and adds materially to the finished appearance. The regular steps are made of metal and in attractive design.

BODY.

The body is the well known and distinctive Peerless type built for seven passengers, the rear seat is amply wide for the comfortable accommodation of three, and the tonneau long and spacious. Extra seats of the folding type have been designed which are practical and comfortable and are easily removed or may be folded against the side of the tonneau when not in use.

FEW CHANGES IN 1910 FRONTENAC

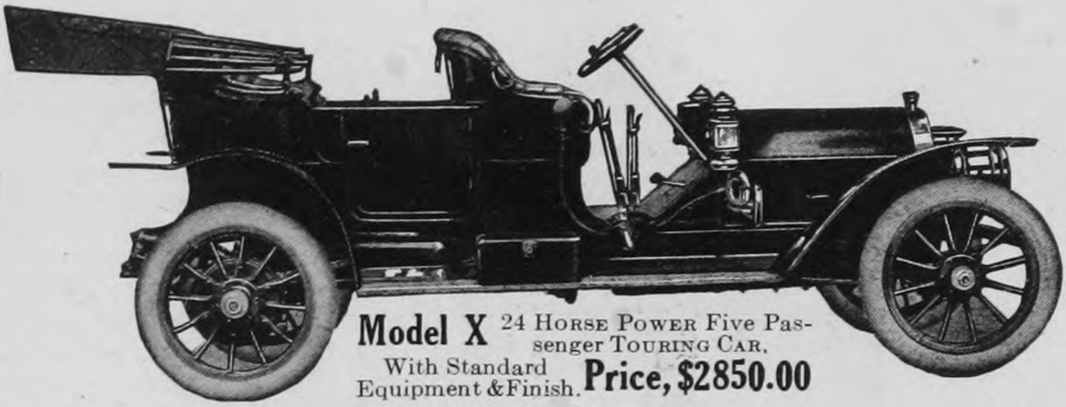
Believing that it is a far saner policy to make only so many cars that can be made mechanically right rather than producing a great quantity and have them assembled hurriedly with bad after results, President J. T. B. Bogardus and his associates in the Abendroth & Root Mfg. Co., Newburgh, N. Y., makers of the Frontenac pleasure cars and trucks, are building a conservative quantity for 1910.

It has not become necessary for the concern to greatly change their 1910 specifications from those now being used. The only decided changes are points of refinements.

Abendroth & Root for 1910 are making practically one chassis for their pleasure cars which include a limousine, touring car and roadster, all rated at 40-45 H. P. The former sells for $4,000, while the touring car and roadster are listed at $3,500. Great care is taken in the finish of the superior wood bodies of all three models and with the exception of the limousine, which is painted according to the buyer's option, the Frontenac pleasure cars are finished in dark green. The roadster has a seating capacity for three, while the touring car and limousine seats six or seven respectively. A four cylinder, water cooled motor with cylinders, 3¾ inches is used. The ignition is by battery and magneto, while the front tires are 34x4 inches and rear 34x4½ inches. The steering is a special device invented by Abendroth & Root, and the clutch is leather faced with cork inserts. There are three speeds forward and one reverse in all models.

Stewart & Clark Lease Chicago Quarters—The Stewart & Clark Manufacturing Co. have leased for three years the quarters occupied by the Cadillac Automobile Co., of Chicago, 1312 Michigan avenue, and will take possession December 1. The new quarters will provide a great convenience for city trade, as it will permit taking care of city orders promptly, avoiding the delays of handling the orders through the factory. A large crew of installers will be on hand, so that speedometer installations can be taken care of there in place of sending the cars to the factory, as heretofore.

STEVENS-DURYEA MOTOR CARS 1910



Model X 24 HORSE POWER Five Passenger TOURING CAR.
With Standard Equipment & Finish. **Price, $2850.00**

SQUARE and TAPER SQUARE
VERSUS
ROUND, TAPER ROUND and KEY
CONNECTIONS IN
DRIVE LINE

The Stevens-Duryea, square, taper square and flange design of uniting each section in the drive line from fly wheel to rear hubs and the forging of pinion gear integral with shaft, is as fine an example of engineering skill as is exemplified in the manufacture of motor cars.

This construction eliminates the use of round, taper round or key design of coupling and overcomes the one weak point in transmitting the power to the rear wheels.

The ease with which a section can be removed is the crowning point in its favor, and the accuracy of its running will be absolutely perfect when replaced, owing to the fact that only a slight pressure is required to make positive its connection.

With the round taper and key, an excessive pressure is required to unite, and if this is not applied, all rotating strains are placed on the key and keyway which cannot be designed to adequately carry the load.

The adoption of squares in drive line entails the highest cost of production and is only one of the exclusive, distinctive, and proven good Stevens-Duryea points, which, when given the most critical examination in regard to design, material, and sound, accurate workmanship, are found to be mechanically correct.

This exclusive drive line feature characterizes all Stevens-Duryea motor cars, and, with its other points of merit, still further enhances their value.

HREE POINT SUPPO

STEVENS-DURYEA CO.

The Wisconsin Machinery and Manufacturing Company, of Milwaukee, Wis., have for several years been devoting their exclusive attention to the building of "Wisconsin Valveless Two-Cycle Motors." The result of this success has led to the designing and building of their 4-cylinder 30 H. P. water cooled motor for pleasure and commercial vehicles for 1910. A modern plant including the latest machine tools is now in course of erection by this company which will give the company a capacity of about forty motors per week. The four-cylinder motor shown herewith has a 4½-in. bore and stroke, and gives 30 H. P. on the brake at 900 R. P. M.

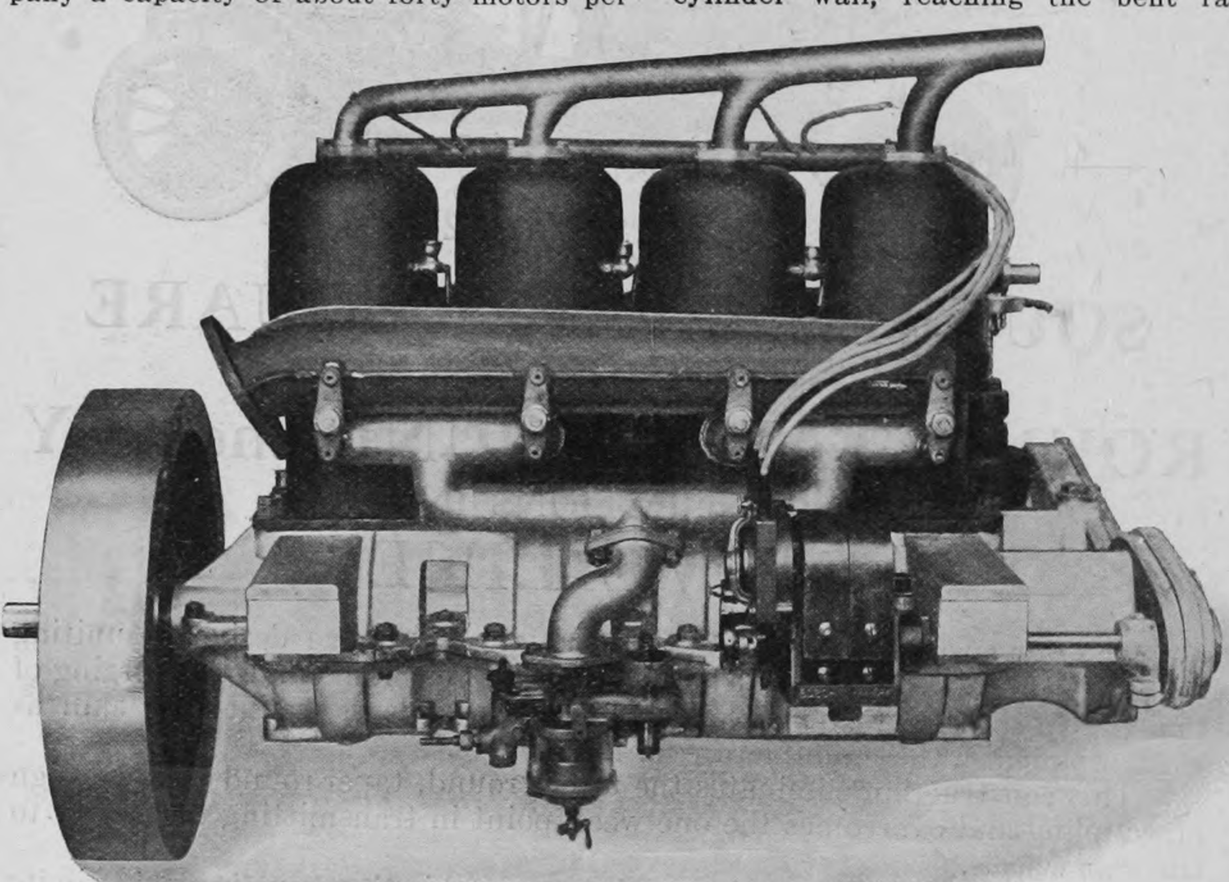


Fig. 1. 1910 Wisconsin valveless two-cycle four-cylinder, 30 H. P. motor. The cast iron exhaust pipe manifo is placed over the brass intake pipe manifold and is retain d so as to permit expansion. This view shows the Bos high tension magneto which is usually fitted with an option on the Remy. The fan is flat belt driven from t pulley on the engine shaft and is mounted on the forward cylinder, the arm swinging to tighten the belt.

The cylinders are cast separately of special hard and fine grained mixture of cast iron with water jackets and heads integral. The exhaust port top is ¾-in. above low piston position and the top line of the third or transfer port is 7-16 above low piston position, the intake port is 7-16 open when the piston has reached its highest point. The compression space has round top corners and with cylinder full of pure cold air and crank turned

The spark plug is located in cente cylinder. Provision is made for drai the compression by means of a d cock.

THE PISTONS.

These are cast of the same mixture the cylinders, are 5¾-in. long, and h ⅜-in. rings at the top, with 3-16-in. tance between and one ⅜-in. ring on bottom. After many trials of different flector form and placing, the diame face with rounded corners against cylinder wall, reaching the bent ra over the port opening, was adopted. T deflector is cast on the piston top and 1⅜-in. high and directs the incoming ga perfectly against the cylinder head. T piston top and deflector are carefully ha finished by filing, scraping and polish with emery cloth, so as to avoid preig tion. The piston rings are turned ecc tric, ⅛ in. thick, and cut under an an of 45 degrees, and held by a 3-16-in. from turning.

THE CONNECTING RODS.

The connecting rods are now st castings in I section, but may be chang to steel drop forgings. The rods are 9 ole is drilled the whole length through hich it is oiled from the cylinder oilers. the center of the bearing journal ⅛-in. oles are drilled for leading the oil to the earings. The piston pin bearings are of xtra large proportions, giving a journal 2¾ in., and are made of phosphor bronze. hey are not split lengthwise and are rced into the piston. The connecting ds lower ends are capped, caps are held ith 2 7-16-in. bolts, double nuts, split pin etained. The rod boxes are of phosphor ronze two-inch outside 1½-in. inside iameter by 2½-in. long and can be relaced if desired by die cast white metal oxes.

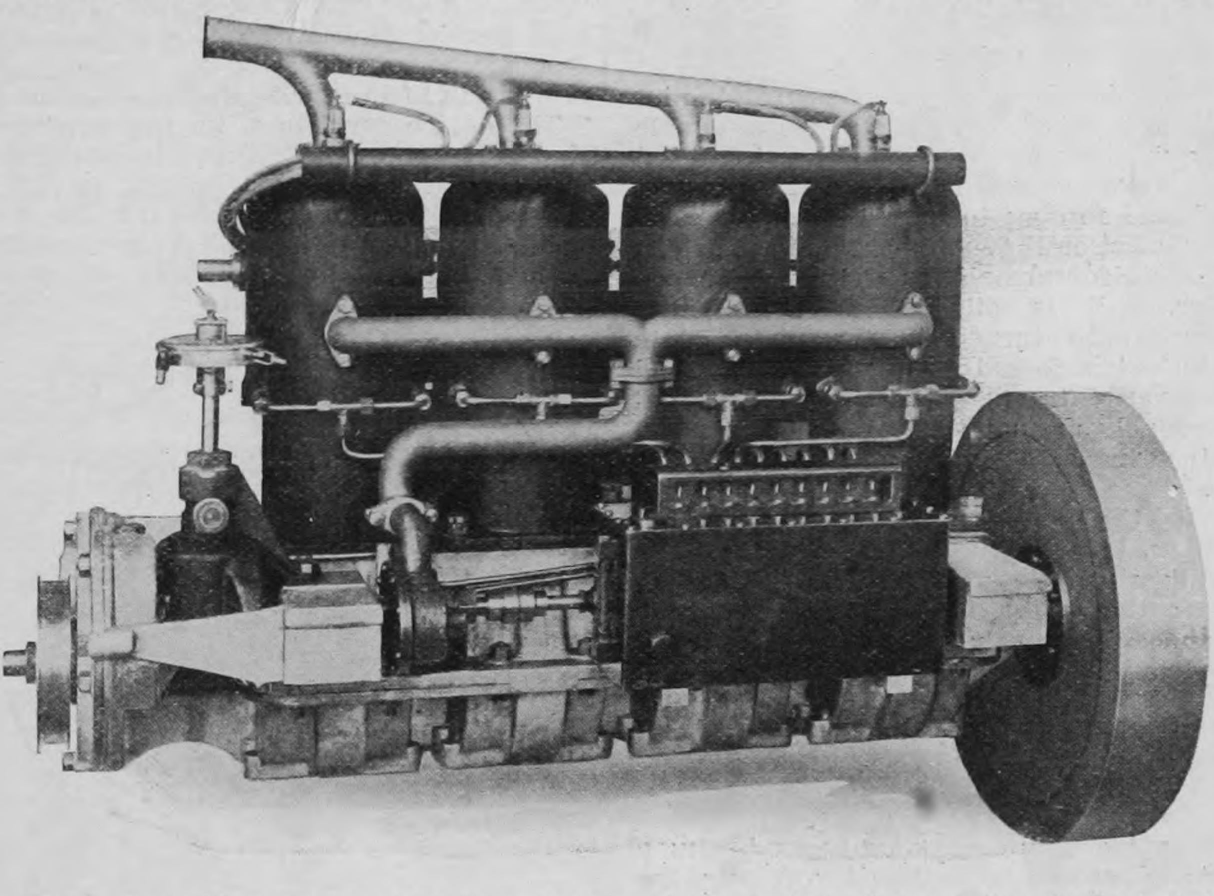


Fig. 2. The pump oiler and timer here shown are driven through an intermediate gear from the crank shaft. The water circulation is by a gear pump. No pipe fittings or hose is used. The capacity of the 9 feed oiler is 9 pints. Note the direct and neat arrangement of the oil pipes.

THE CRANK SHAFT.

The crank shaft is made from a special rade of open hearth steel and has 5 ournals, 1⅝-in. diameter and four wrists ½-in. diameter. The two front wrists re 180 degrees apart, and the two rear rists are also 180 degrees apart and are et 90 degrees behind the front wrist air. The center bearings are 2⅝-in. ong, are plain bronze half boxes with aps and liners. The main or side bearngs are 4¾-in. long, flanged. The front earing is solid, the rear bearing is made

is reduced to a minimum and increased the maximum crank box pressure to 8 pounds.

THE CRANK CASE.

The motor base and oil base are 90 per cent. aluminum casting. The motor base has 4 long lugs 3-in. wide and are designed to hang on top of the engine frame, so that one bolt through each of the 4 lugs pinches the frame side and a distance piece if necessary, and base lug all together. The cylinder face is bolted with 4½-in. studs directly to the motor base, no packing used. The oil base is 4⅛-in. by 4½-in. open on the bottom and a hand plate is held by eight ⅜-in. studs. Provision is made for draining the oil.

The gear case, housing the gears for driving pump oiler and commutator draft on one side and the magneto on the other, is cast on the crank case. The gear case is oil and dust tight to allow the gears to run in an oil bath. The gears are bronze cut and of very fine pitch, thus making them noiseless. The half time shaft drives the water circulation pump, which is of the gear type, and the oiler. Between each are steel couplings, easily removed to disconnect one or the other without taking off any other part. The commutamanifold are of special design and are fastened with four steel spanners. The fan is driven by a ¾-in. flat belt, has six aluminum vanes 4-in. wide connected by a ring. The fan is 16-in. outside diameter and makes 2¼ turns to one of the crank shaft. The fan bracket is mounted on the first cylinder and is adjustable for tightening the belt without cutting same.

The fly wheel is 17½ inches in diameter, has a 3½-in. face and is designed to fit a 15¾-in. diameter 12½ degrees 2⅝-in. face standard cone clutch, but will be replaced by a regular fly wheel where no fly wheel cone clutch is to be used.

LUBRICATION.

The lubrication is by mechanical oiler with ten feeds of the valveless double plunger type, forcing oil to the sight feed and drawing positively from the sight feed and forcing to delivery points. The oiler is set on the motor base and is driven by a horizontal half time shaft. The cylinder wall is oiled from both sides. Grooves are turned in the piston, into which oil is forced during its upward and downward travel, depositing this oil thoroughly around the cylinder walls and piston rings. The piston pin bearings are oiled from the cylinder oiler. Oil is picked up by the piston pin, conveyed through a ⅝-in. hole in the pin and from here to the bearings through holes drilled in the pin in the center of each bearing journal. Each center bearing and main bearing is oiled by one feed. The oil passes into and around the bearing and floods it. The overflow is led through the crank shaft to the crank wrists.

IGNITION.

A double ignition system is used. Jump spark plugs can be switched over from the battery after starting to the magneto. Bosch or Remy high tension magnetos are furnished at the option of the purchaser. An independent coil and storage battery is furnished for starting, although the motor may be started successfully on the magneto under ordinary conditions. The wiring is of the best grade and encased in a tube fastened on the cylinder. A Connecticut timer is used.

The New Bosch Dual Ignition, combining in a simple manner magneto and battery ignition will be furnished upon request.

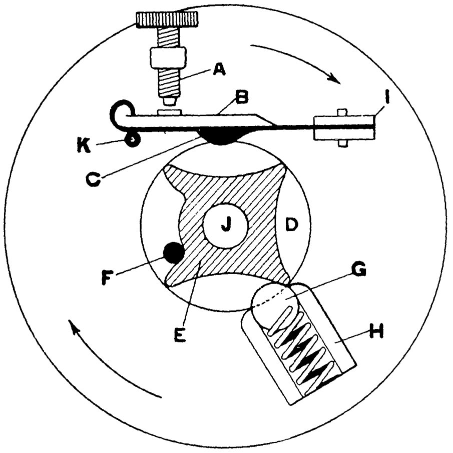
The Wisconsin Valveless Motor is also built in three and two cylinder of the same bore and stroke, using the same casting as far as possible. The three cylinder is said to give 24 H. P. on the brake, the two cylinder 15 H. P. and the single cylinder 8 H. P. on the brake at 1000 R. P. M. The single and double cylinder motors are mechanically counterbalanced, eliminating the vibration as nearly as possible.

The two and three cylinder motors are especially designed and recommended for light delivery wagons, doctor cars and high wheel buggies.

THE "RHOADES" UNIT TIMING SYSTEM

The Altemus Mfg. Co., of 42nd and Chestnut streets, Philadelphia, is manufacturing the Rhoades unit system, invented by Lewis T. Rhoades, and which comprises a complete electrical system for providing one single spark per ignition. It is claimed that this device will produce perfect ignition on 1-16 ampere and that one set of dry cells will furnish ignition from 2,000 to 4,000 miles.

The device consists of an improved mechanical circuit closing and breaking device, which is mounted on the top of a high tension distributer case. A specially designed non-vibrating coil is used, which is mounted on the dash, and the same is fitted with a kick switch. The feature of the system consists in the mechanical movement of the circuit controlling apparatus which is of very ingenious construction. No spark is produced should the engine turn backward and it is also impossible for the engine to start with the circuit closed. The same amount of current is consumed regardless of engine speed as the device is so designed that the cam which forces the contact spring into contact turns at one point of its revolution above the time shaft's speed.

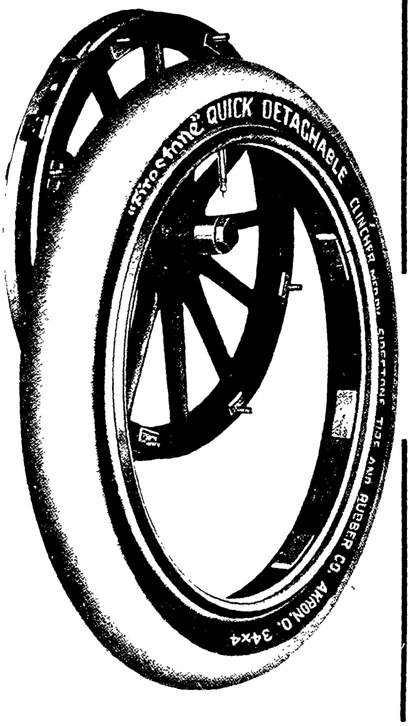


Diagrammatic view of the "Rhoades" Sparker.

A description of the operation of the device follows: On the top of the shaft J is rigidly connected a disc D from which extends vertically a pin F. Loosely mounted on shaft J is a four-pronged cam E. This cam is connected to disk D by means of a spiral spring which is under some tension so that cam E is normally held against pin F. H is a tube in which is mounted a ball G, said tube being slightly closed and a spiral spring is employed

You'll Come to Them Sooner or Later—

Why Not Now?



Demountables are the coming rim-equipment. This year the Demountable Rim equipment has been standardized. Because of its immensely greater convenience, the great saving of time and trouble it effects, its extreme handiness and simplicity, motorists by the hundreds, by the thousands have changed their old-style stationary equipment for that more modern means of quick and easy tire-changing, the DEMOUNTABLE RIM.

And out of all the hundreds, the thousands of those who have been so converted to Demountable Rims, none have had anywhere near as thoroughly satisfactory an experience as those who were farsighted enough to equip with

"Firestone"

Demountable Rims *(For all Quick Detachable and Clincher Tires)*

Here are just a few of their advantages:

When tire-trouble comes your way—unlock the damaged tire, slip on the tire already inflated—then go on your way. A tire change is so easy, so quick, so simple with FIRESTONE Demountable Rims that there's no temptation to run on a flat tire and so wear the life out of it. There's nothing difficult or disagreeable in making the change—no struggling to remove old tires—**and—no pumping up on the new!**

Unlike Demountables for clincher tires only, FIRESTONE Demountables abolish the short stem stay bolt nuisance altogether. You can make as many tire-changes as you like en route—even **after** the spare tires have been used up.

You can have your car equipped with FIRESTONE Demountables in 24 hours. You'll come to them sooner or later—WHY NOT NOW?

Have the nearest FIRESTONE dealer demonstrate for you

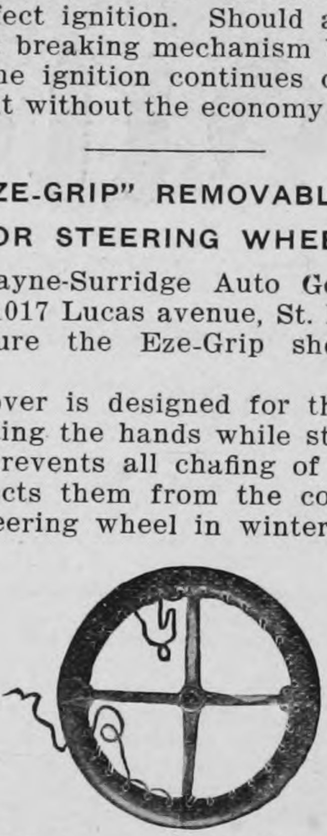
FIRESTONE TIRE & RUBBER COMPANY
Largest exclusive Tire Makers in the World
Akron, Ohio

its movement is momentarily stopped. As disc D continues to revolve pin F travels forward until it strikes opposite projection on cam E, causing same to force ball G down when it is released from the spring tension, the spring in this described movement being wound up still further. Cam E now travels this small portion of its movement at a rapid rate of speed due to the action of a coiled spring which exerts a contention on the cam E in a right hand direction. It is just at this cycle that arm C is placed on which is formed a cam. One of the projections of the large cam E forces contact arm outward, causing spring B to make contact with screw A, and which contact is broken as one of the projections of cam E passes over dwell of cam C. This operation takes for each projection on large cam E. Arm C is pivoted in a movable pivot I, so that it can swing in a vertical as well as horizontal position. As the lower edge of cam C is slightly beveled should shaft J turn backwards, contact arm C is raised in a vertical movement allowing cam to press without forcing same into contact with screw A, as a spring normally holds contact arm C against a spring or stop K. The device complete is 2¾ inches in diameter by 4½ inches long, and all moving parts are made of special hardened steel. The entire adjustment is made by one screw which may e varied 1 to 6 turns without interfering ith perfect ignition. Should any part of he quick breaking mechanism become deanged the ignition continues or is interupted but without the economy of current.

THE "EZE-GRIP" REMOVABLE COVER FOR STEERING WHEELS

The Hayne-Surridge Auto Goods Company, of 1017 Lucas avenue, St. Louis, Mo., nanufacture the Eze-Grip shown herevith.

This cover is designed for the purpose f protecting the hands while steering the ar. It prevents all chafing of the hands nd protects them from the cold surface f the steering wheel in winter, and also

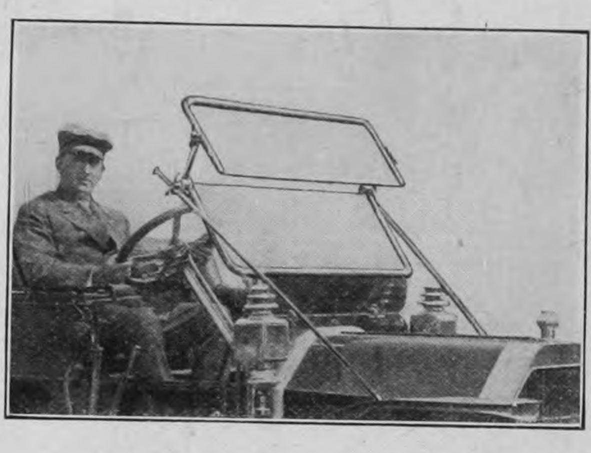


The "Eze-Grip" Patent Removable Cover for Steering

black, tan, red or blue, and is lined wi wool felt. It protects the wooden steerir wheel from cracking and warping, t metal from rusting and tarnishing. laces tightly around the steering whe which improves its appearance. The li price is $5.

THE "AJAX" WINDSHIELD

The "Ajax" windshield, manufacture by the Novelty Manufacturing Compan Waterbury, Conn., gives any positio desired in either upper or lower glas All adjustments are made by only thre by telescoping stay rods in any positio Ball and socket joints are fitted at bot ends, thereby avoiding all strain.



The "Ajax" Windshield; Rain Position.

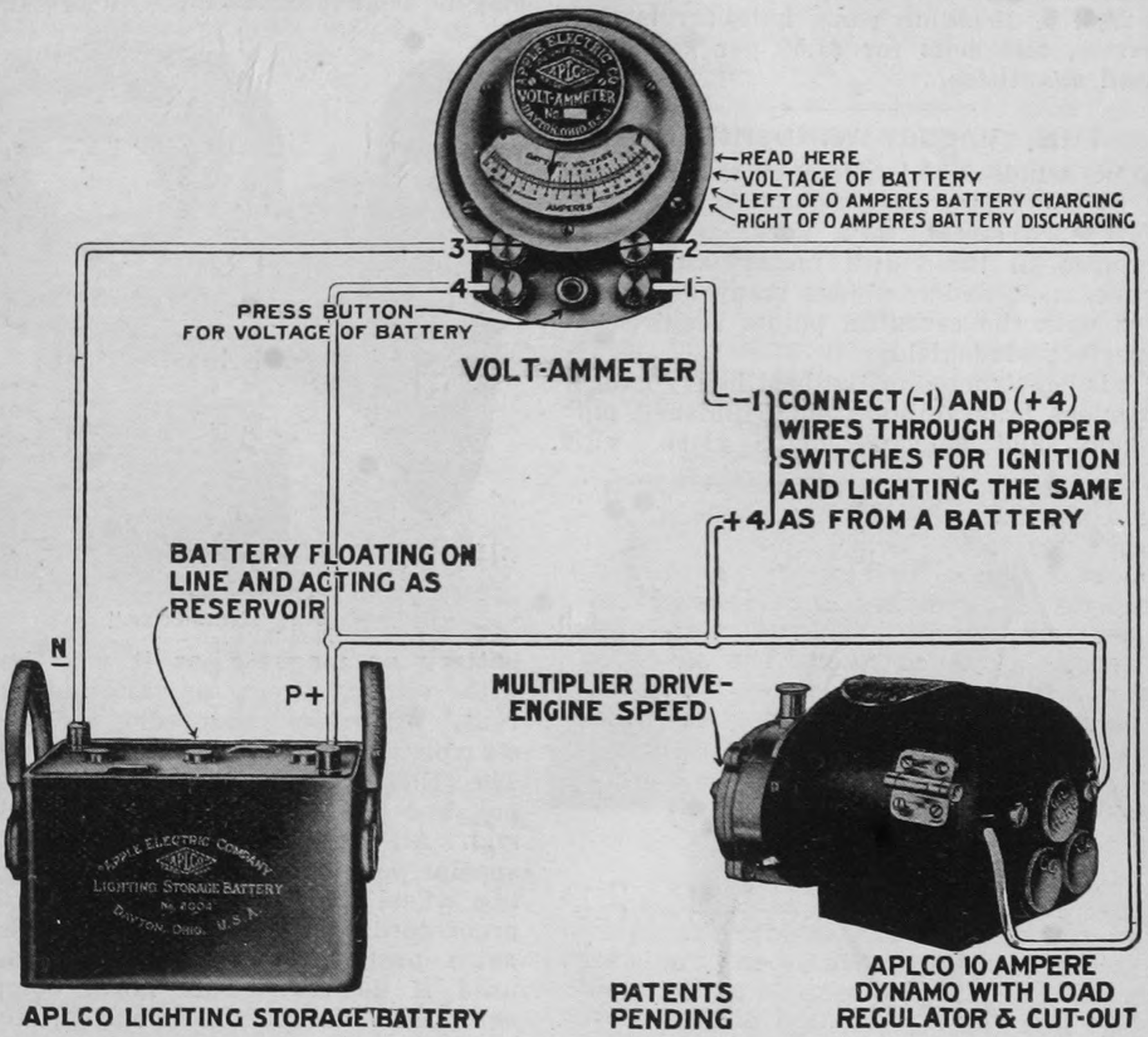
The upper glass is always furnished 1 inches high while the lower is furnishe in 14, 16, 18 and 20 inch heights. Th width is 42 inches. One of the features o this shield is that it has no metal border at the folding line to obscure th vision and the small opening between th glass infuses a current of air, thus avoiding back drafts on the back of the neck. The price of this shield, complete with filler board, etc., is $50.00. This shield is manufactured by the Novelty Mfg. Co., Maple street, Waterbury, Conn.

CALLAHAN'S "NON-CORROSIVE" SOLDERING FLUID AND "OLD RELIABLE" PIPE CEMENT

George Callahan & Co., 218 Front street, New York, are the manufacturers of "Old Reliable" steam and pipe joint cement and "Non-Corrosive" soldering fluid, both of which are being used by quite a few automobile manufacturers.

The "Old Reliable" steam and pipe joint cement is used for cementing steam, water, oil or gas pipes. It is cheaper than red lead and is quick setting, making a tight joint which, however, can be easil

An Automobile Improvement Which Makes It Safer, Simpler and More Economical


APPLE ELECTRIC CO.
APLCO
VOLT-AMMETER
No.
DAYTON, OHIO, U.S.A.
BATTERY VOLTAGE
AMPERES
←READ HERE
←VOLTAGE OF BATTERY
←LEFT OF 0 AMPERES BATTERY CHARGING
←RIGHT OF 0 AMPERES BATTERY DISCHARGING
3
2
4
1
PRESS BUTTON FOR VOLTAGE OF BATTERY
VOLT-AMMETER
-1
+4
CONNECT (-1) AND (+4) WIRES THROUGH PROPER SWITCHES FOR IGNITION AND LIGHTING THE SAME AS FROM A BATTERY
BATTERY FLOATING ON LINE AND ACTING AS RESERVOIR
N
P+
MULTIPLIER DRIVE-ENGINE SPEED
APPLE ELECTRIC COMPANY
APLCO
LIGHTING STORAGE BATTERY
No. 2004
DAYTON, OHIO. U.S.A.
APLCO LIGHTING STORAGE BATTERY
PATENTS PENDING
APLCO 10 AMPERE DYNAMO WITH LOAD REGULATOR & CUT-OUT

The latest and most novel use to which electricity has been put in the last year or two is for electric lighting, in addition to igniting gasoline automobiles, as is now accomplished by the "Aplco" Electric Lighting System for automobiles as has recently been perfected by V. G. Apple and his corps of engineers and mechanics.

The "Aplco" System eliminates flame with its fuel of coal oil and acetylene entirely from the car.

The "Aplco" System saves the cost of coal oil, carbide and having batteries and gas tanks continually recharged in addition to the time saved.

The "Aplco" System replaces dry batteries, vibrator coils, troublesome timers, magneto, gas tank or acetylene generator, coal oil, acetylene gas, carbide, oil lamp fixtures, gas lamp fixtures, matches, loss of time stopping car to light and regulate acetylene gas, as with the electric system it is all done by switches from the seat at will.

Besides the greater convenience of an electric lighted auto, the light, which is whiter and stronger, will be projected farther than is now possible with the acetylene headlights now commonly in use. The electric lighting of automobiles, in addition to being more convenient, is much more economical, as it saves the total cost of oil, carbide or acetylene and the expense, trouble and annoyance of having batteries and gas tanks continually recharged.

Can be installed on any machine. Send for descriptive booklet. Agents wanted in unoccupied territory.

Brown Japan is mixed with the oil.

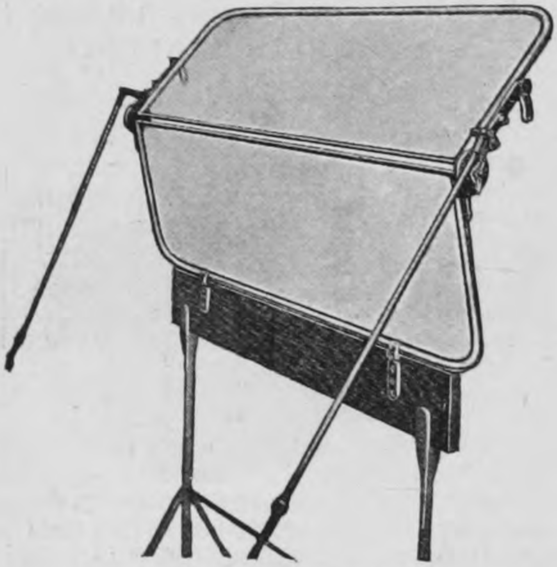
It sells in kegs or pails for 20 cents a pound and in barrels or casks for 18 cents.

The Non-Corrosive soldering fluid, as the name implies, neither rusts nor corrodes and is non-poisonous. It makes a clean, smooth, permanent job and keeps the soldering irons clean. It is put up in 1, 2, 3, 5, 10-gallon cans, half-barrels and barrels, and sells for $1.50 per gallon in small quantities.

THE "VASCO" WINDSHIELD

This windshield is designed and marketed by the Victor Auto Supply Mfg. Co., 42 West 43rd street, New York, and manufactured in their own factory at Providence, R. I., and combines many new features with the essential points required in a perfect windshield.

It is constructed of the best heavy gauge, seamless brass tubing, piano finished mahogany and selected plate glass, with castings of superior grade, accurately milled and interchangeable and is sold at a reasonable price.

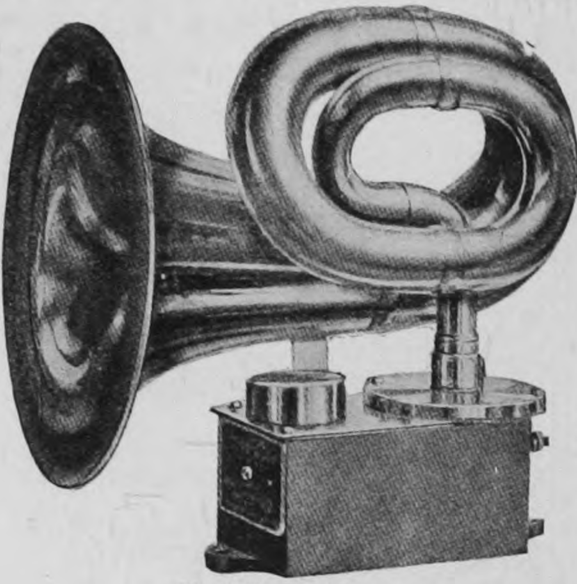

The "Vasco" Windshield.

The use of friction discs instead of springs makes the operation of the shield easy with one hand under all conditions. All glass is protected, making breakage by jar absolutely impossible. If desired, the top half can be locked in a tilting position, absolutely rigid, by a short turn of the friction discs.

An important feature is the gap or means of opening the shield at the parting, permitting an unobstructed vision ahead in rain or fog and at the same time giving perfect protection from the elements. The shield folds inside the car,

ated automobile horn manufactured b the Electro-Corno Co., 46-48 W. 28t street, New York. It is absolutely foo proof and is operated by simply pressin the button.

It is suitable for either large or sma cars and may be blown without loosening the grip on the steering wheel. I may be connected direct with the ignitio battery or magneto, as it may be use with either direct or alternating current, otherwise four dry cells or six volt storage battery is most sufficien The Electro-Corno is made entirely o polished brass, with a base of black enamel. All contacts are platinum pointed. special push button is fitted to the steering wheel and is connected by a waterproof cord to the horn and batteries. A extra push button for the foot may b used if desired. This horn, completel equipped with wire, push button, etc., list at $20.00.

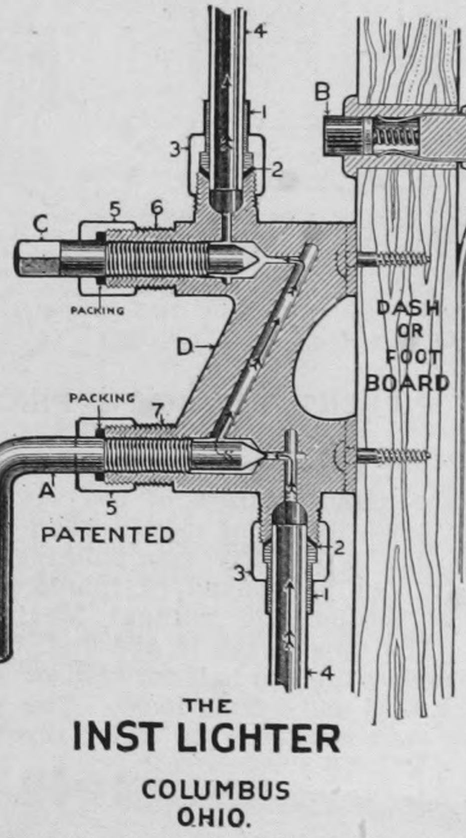

The "Electro-Corno."

CASTINGS FOR AUTOMOBILE ENGINES

The Hall Gas Engine Mfg. Co., of Bye ville, Ohio, are making automobile an marine engine castings in their new up-to date foundry, which is especially fitte for this line of work. They are manufacturers of the Hall Opposed Engine which adds considerable to their know edge of what a casting ought to be to machined right, at the lowest cost.

The foundry makes a specialty of thi particular line of work and in the size used in automobile engines, the iron, san coke and other material, and the cor ovens, cupola and entire foundry equi he Inst Lighter, a device which is d for lighting the gas lamps on auto- biles, is shown herewith in improved n.

he gas from the gas tank is piped to gas controller shown in accompanying stration. This controller is screwed to the dash, driver's seat, or foot- rd. A pipe then leads from the gas troller down to the ordinary piping hose connection with which the car lready equipped. These in turn lead he two headlights.



tional view of controlling device of the "Inst" lighter.

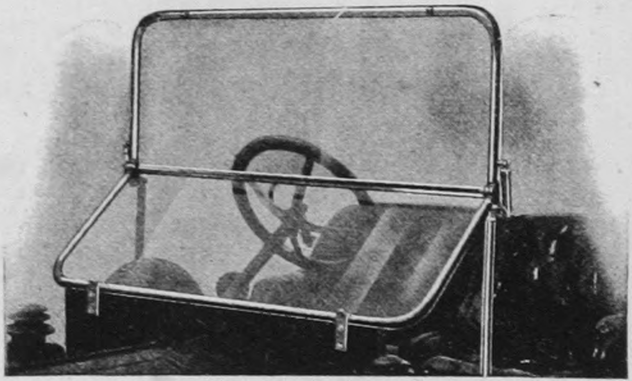
he controller is made of special heavy brass highly polished, and contains very finely threaded steel needle es which work independently of each er. The Needle C (which can be ad- ed with a gas tank key when neces-), is set to allow the gas to flow to the ps at the proper pressure to give the light. The Needle A, has a perma- t handle and is used to turn the gas and to shut it off.

turning on the gas with Needle A, no need be taken to turn the handle to certain point. It is only necessary to it a part of a turn, Needle C pro- es the necessary adjustment. The dle valve A can be used for lowering the ts below the ordinary height while ing in parts of cities where bright ts are not permitted. Upon leaving

side the gas controller. A special coil is furnished which can be mounted in the battery box or under one of the seats. Special wire of two kinds and clips for the spark gaps at the burner, together with pipe, conduit, screws, and instructions constitute an Inst Lighter outfit. The installation of the Inst Lighter is very simple. The price of the Inst Lighter has been reduced from $25 to $15. The device is manufactured by the Inst Lighter Co., of Columbus, Ohio.

THE AUTO-AUTOMATIC WINDSHIELD

The Auto-Automatic Windshield Company, which has recently removed its offices to the new automobile row in the George Building, 870-872 Woodward avenue, Detroit, Michigan, is manufacturing, in addition to its straight shield, a new zigzag or tilting shield for roadsters and large touring cars, which have considerable rake to the steering post.

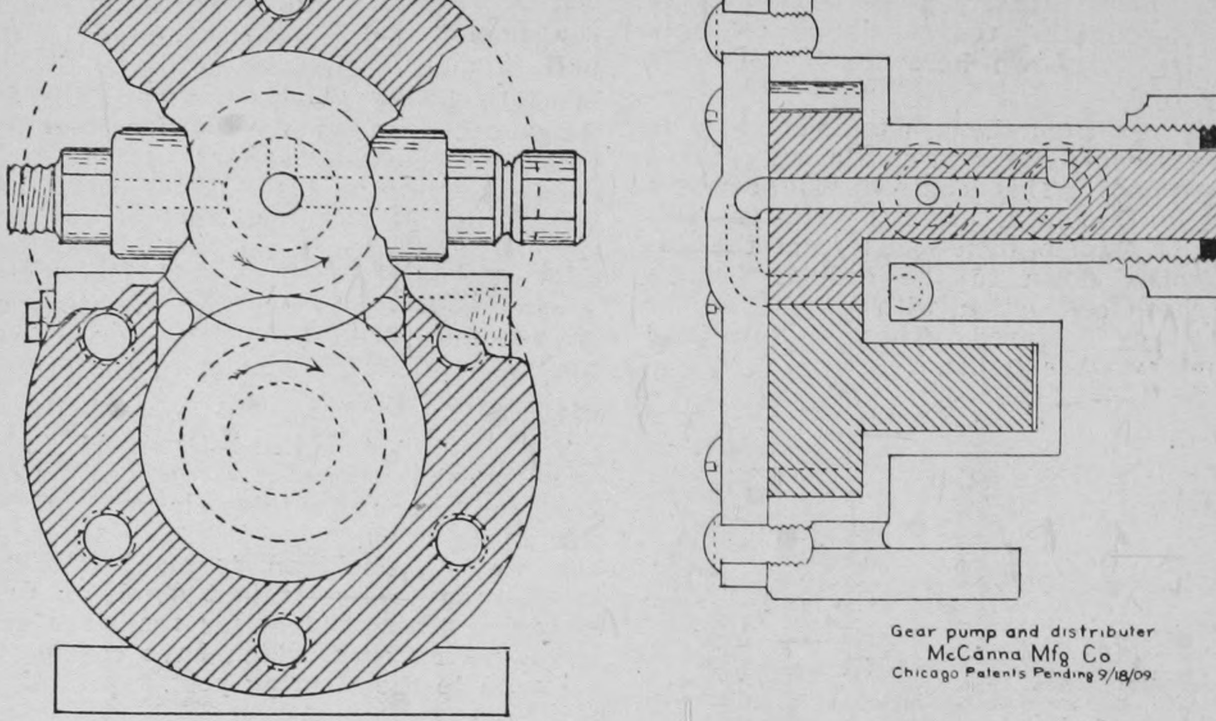


The "Auto-Automatic" Windshield.

This roadster shield uses the same locking mechanism that has met with success on the Auto-Automatic Straight Shield. It is claimed to positively and securely lock in both its upright and folded position, so that there is no possibility of rattling. This lock consists of a short smooth working groove plunger and a spring actuated ball engagement at the lower end of the piston barrel. Both plunger and ball lock are of the best hardened steel and are under spring tension and capable of adjustment where necessary.

In addition to this lock, the plunger is supplemented by a spiral spring entirely enclosed in the piston barrel and is further provided with a practically air tight gasket which works on the principle of a door check. The best grade of plate glass, channeled frame and solid brass castings and bolts are used throughout.

The Pope Mfg. Co. of Hartford, Conn.



Sectional view of the "McCanna" Distributing Pump.

THE "McCANNA" DISTRIBUTING GEAR PUMP

The distributing pump illustrated herewith is designed primarily for those using the center crank oiling system with separate tank, or for open or ring oiling, or regular circulating oiling systems where it is desirable to distribute the oil to two or more places.

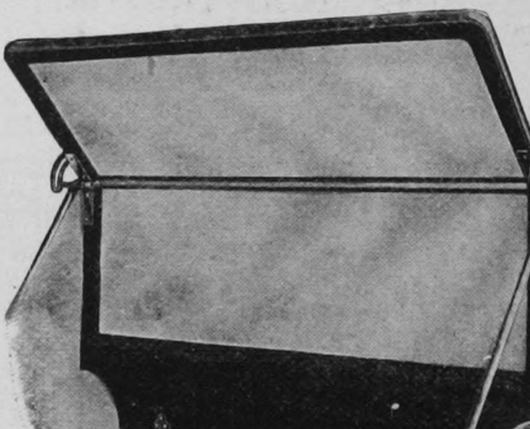
With this pump it is claimed to be almost impossible for any failure of the oiling system to occur at any point as each lead is as positive as if controlled by an individual pump as no two ports are open at the same time; in this way the pressure generated by the pump is applied to each lead in turn as the ports register. This pump is made with any number of leads.

The oil is taken into the pump through the regular suction and is forced by the gears through the channel cut in the cover into the hollow shaft the openings of which register. This hollow shaft revolves, opening and closing the discharge ports, which are located in the sleeve around this shaft, and as the ports in the shaft and the discharge ports register the oil is forced on to its destination. This pump is the product of the McCanna Mfg. Co., 56-58 N. Jefferson street, Chicago, Ill.

The Hercules Electric Company, of Indianapolis, Ind., are starting the third ad-

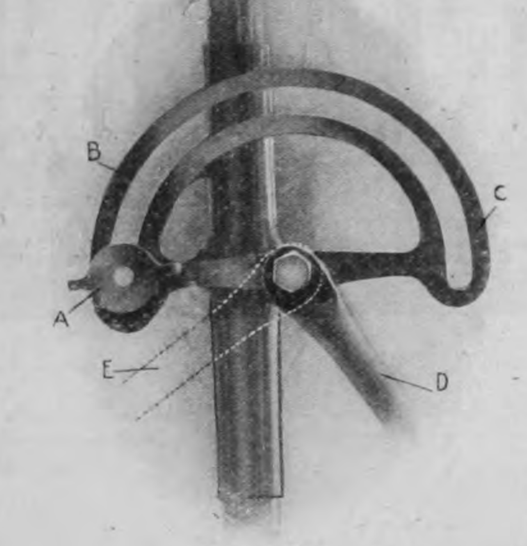
THE "PIERCE" AUTOMATIC FRICT WINDSHIELD

Geo. W. Pierce & Co., Anderson, ana, are manufacturers of the winds shown herewith. The main feature of shield lies in its easy manipulating q ties. It can be opened or folded in than a second and without leaving seat. The upper sash is operated by ply pushing the top half forward or pu it backward and letting loose. The w of the sash carries it on down slowly



The "Pierce" Automatic Friction Windshield

it automatically catches and fastens securely. To open the shield, the sar raised into position and the same de catches and holds it there.



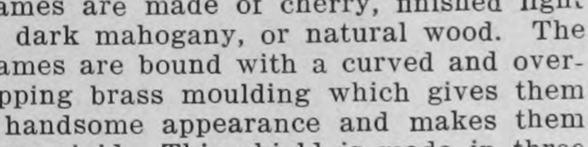
utomatic Friction Hinge used on the "Pierce" Auto-tic Windshield. This friction hinge allows top half shield to fall slowly and safely down in folding, but ds it securely when folded or opened. Friction is at A l is provided with an adjustable tension so that the ction may be kept uniform in case of wear. At B ction releases itself and engages again at C at which nt shield is folded. D is brace rod and dotted lines show position of brace rod, D may be shifted too so eld may be put on machine to fold either in or out.

claimed, assumes the form of rubber d never sets or becomes hard. The ames are made of cherry, finished light dark mahogany, or natural wood. The ames are bound with a curved and over-pping brass moulding which gives them handsome appearance and makes them ore rigid. This shield is made in three zes to fit all makes of cars and widths dash boards.

THE "RONSON" WRENCH

The cut shown herewith shows the Ronson" wrench which is being placed n the market by Cryder & Company, Park venue and 63rd street, New York.

It is claimed this wrench replaces nine ngle wrenches of the same type ranging n size from 3-16 inch up to 13-16 inch. It six inches long and weighs eight ounces.



The "Ronson" wrench.

Each of the four members shown is made f flawless plate steel, most carefully heat empered, so that the wrench fully copes ith almost any need in which a wrench is f service. Each is a perfect wrench in it-elf.

The center bolt and wing nut are drop orged, and when one of the ends is pulled ut for use, the rest form a handle giving

can be carried in the pocket without inconvenience and the thinness of the members coupled with their great tensile strength allows it to be used in places where other wrenches could not be of service. It lists at $1.50.

THE "PURITAN" GASOLINE TUNNEL

The "Puritan" Gasoline Tunnel, illustrated herewith, is manufactured by the Sexton Can Company, 2-4 Hartford street, Boston, Mass.

This tunnel consists of a round galvanized can having a drain pipe leading from the center of the bottom. Into this fits the strainer which is also galvanized and open at both ends. Over the lower end a chamois is stretched and tied on. This chamois may be removed and washed and if properly taken care of will last indefinitely.

"Puritan" gasoline tunnel with chamois strainer.

The "Puritan" Tunnel is made in three sizes, 7½ in., 10 in., and 12 in. and sells for $1.50, $2.00 and $2.25 respectively.

Schacht Co. Acquires Buildings—The Schacht Mfg. Co., builders of the "Invincible Schacht" auto runabout, have acquired through purchase, the buildings at 2727-2735 Spring Grove avenue, Cincinnati, Ohio. The property consists of two finely equipped buildings, one hundred by five

DELCO IGNITION

"NO SPARKS OUTSIDE THE CYLINDER"

Your ignition troubles cease the day DELCO is put on your car. Think of driving

Ten Thousand Miles Without Ignition Adjustment

And this is not a high figure; Delco sets have been run over 20,000 miles without a single adjustment. Then when adjustment is necessary all you have to do is move a ratchet one notch.

Here are a few more ways that Delco will help you:

No sparking at the timer, eliminating nine-tenths of timer troubles.

No sparking at primary contacts, insuring long life.

No heavy storage battery, with consequent storage battery troubles. Six dry cells will run your car 2000 miles or more.

No master vibrator; no vibrators on coils.

Nothing on the dash but the switch, giving your car an up-to-date appearance. The Delco switch is the best ever placed regularly on automobiles.

Starting button on switch makes cranking easy in cold weather, and unnecessary if there is any charge in the cylinders.

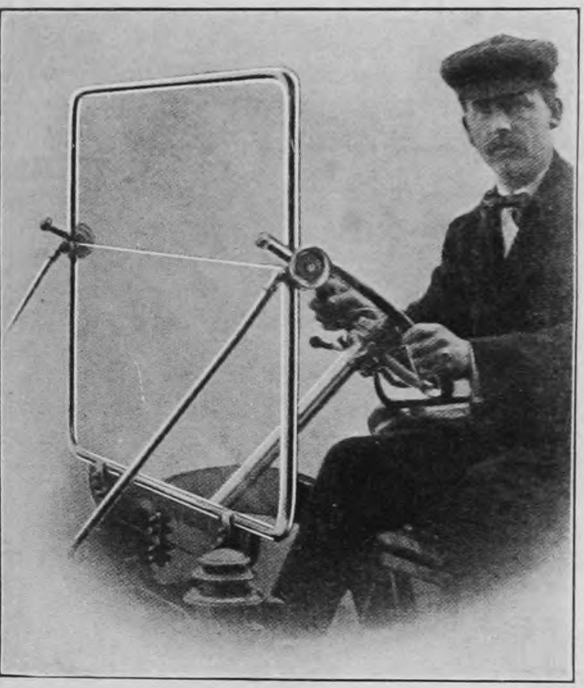
Delco Ignition Systems are made in one of the most modern and well-equipped electrical manufactories in the world, under closest expert supervision. Every set is fully guaranteed by us.

WRITE FOR CATALOGUE

THE DAYTON ENGINEERING LABORATORIES CO.

Dayton, Ohio, U. S. A.

The Cox Brass Manufacturing Co., of Albany, N. Y., has recently placed on the narket, the Cox Clear Vision Automatic Windshield illustrated herewith As the ame implies, this shield has no obstrucion in front of the eyes. The two pieces f glass come close together in the center, iving the appearance of one piece. The hield also has a third position, which is ery important in night riding. The top alf of the shield can be set on an angle vhich overcomes any reflections, and nakes a good position in rain.



The "Cox" Windshield.

The principle of construction is a ball earing lock with sockets in the circle rack. It is made entirely of plate glass nd brass. The glass is bedded in chanel rubber, which does away with all ratle.

THE 1910 THREE CAVITY ADJUSTABLE SECTIONAL VULCANIZER

This accompanying illustration repreents the No. 7 new improved adjustable ectional vulcanizer manufactured by the uto-Tire Vulcanizing Company, Lawence street, Lowell, Massachusetts. his vulcanizer has three cavities, and vill cure any tire that is made, either forign or American make, from 2-inch moorcycle to 4½-inch automobile tires of all he various makes of clincher type, Quick etachable, Goodyear or Dunlop style and thers, also Fisk mechanically fastened.

This vulcanizer is provided with twelve clamping the bead irons in place. It is steam jacketed and is cast in one piece having no packed or bolted joints, thus avoiding the possibility of leaks. The vulcanizer is very compact, occupying a space only 24 inches long and 20 inches wide.

AUTO TIRE VULCANIZING CO
MANUFACTURERS
LOWELL MASS. U.S.A.

The 1910 Three Cavity Adjustable Sectional Vulcanizer.

Attention is called to the fact that this vulcanizer generates its own steam, and has an extra deep space under the bottom of the cavities so as to avoid burning that part of the repair before the rest of the patch is cured.

The cavities and bead irons are machine finished in a lathe throughout, also the cavities are milled to conform to the diameters of the tires, thus insuring a perfect fit and finish. Each cavity is fitted with two clamps and they are adjustable so that a larger or smaller size casing may be cured in any cavity, casing varying 1-inch or more in size (also casings of both American and foreign make having flat treads and flat sides), may be cured perfectly. The 2½-inch cavity is 16 inches long, the 3½-inch is 18 inches long, the 4½-inch cavity is 20 inches long.

The No. 6 vulcanizer is exactly like the No. 7, except it has two cavities. It will take any tire from 4½ inches to 5½ inches. Both cavities in this vulcanizer are 20 inches long. This vulcanizer occupies the same space as the No. 7 vulcanizer. It is fitted with six sets of bead irons, one each for Clincher, Fisk and Goodyear or Dunlop style. These vulcanizers ca

STERLING £ TIRES

WHEN one of our tire makers puts a layer of fabric or rubber on a core, he has to stop till it is inspected—then he puts on another, and that's inspected. In addition, each tire maker gets a weekly premium for a perfect score—meaning "no seconds."

Sterling tires are cured on air-bags, giving internal as well as external pressure, and thoroughly amalgamating the different fabric plies and layers of rubber. That's why Sterling treads and carcasses don't separate—they stay "put."

Sterling Blue Tubes

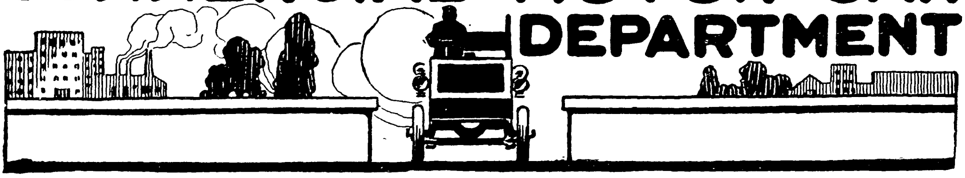
Our tubes are blue and in making them blue we make them better than any other tube. There may be other tires nearly as good as ours, but the Blue Tube is absolutely unequalled.

Rutherford Rubber Co., Rutherford, N. J.

New York, Broadway, at 53d St.
Baltimore, 300 W. Baltimore St.
Columbia, S.C., E. A. Jenkins Motor Co.
Albany, Ga., Clark's Garage
Troy, N. Y., 1934 Sixth Ave.
Rochester, S. B. Roby Co.
Toledo, O., 436 Summit St.
Cincinnati, 108 W. 3rd St.
Newark, O., Ball-Fintze Co.
Chicago, 1404 Michigan Ave.
Philadelphia, 680 North Broad St.
Richmond, Gordon Motor Co.
Savannah, 109 W. State St.
Jacksonville, McGraw Bros. & Vogt.
Syracuse, 248 W. Washington St.
Buffalo, 43 Niagara St.
Columbus, 15 E. Spring St.
Dayton, O., 4th & Jefferson Sts.
St. Louis, 3932 Olive St.
St. Paul, 16 W. Fourth St.
San Francisco, 50-56 Van Ness Ave.

STERLING BLUE TUBES

COMMERCIAL MOTOR CAR DEPARTMENT



EDITORIAL

KEEPING TABS ON THE DRIVER

One of the difficult problems which confront those in charge of commercial vehicle delivery service is to so perfect the system that the drivers cannot, even if so inclined, seriously abuse the machines.

One of the most common abuses of the truck and one that is indulged in at times by almost every driver is that of operating the machine at its highest possible limit of speed. Deliveries are often delayed or the truck gets held up unusually long by traffic, parades, or some unusual condition, a friend is met who takes up considerable of the driver's time, of course the driver being willing, with the result that there is a tremendous temptation as soon as the deliveries are made to speed the machine to its utmost to get back to the stable and finish the day's work. This temptation is too strong for the driver to resist and the truck is, therefore, made to suffer.

One of the features which might be criticised in the average motor truck is the fact that it is geared too high and is capable of greater speed than it can reasonably be expected to stand, especially on routes over rough city streets. If this difficulty is guarded against by gearing the machine lower, then the driver in his eagerness to make up time, races the engine continuously to its great detriment. In trucks fitted with a gear which may be termed a happy medium, considering the weight of the machine and the character of the loads, and operated by a man who uses judgment, there is not any great difficulty in getting good interest on the investment, considering the amount of work that such a machine will handle, but these conditions are ideal and very seldom realized.

The speed at which a truck can be driven without damaging it of course depends on so many variable quantities, such as the character of the streets over which it is driven, the kind of loads, their method of distribution, the type of the machine, kind of tires, etc., that it is impossible to give any general figures. Reasonable and safe speed can, however, be very accurately determined bv the makers if they care to investigate the subject, or can be determined by inspection of the use and abuses to which their trucks are being subjected in actual service by typical business firms. The wise maker keeps closely in touch with the user, noting his difficulties and finding out wherein the truck fails, if at all.

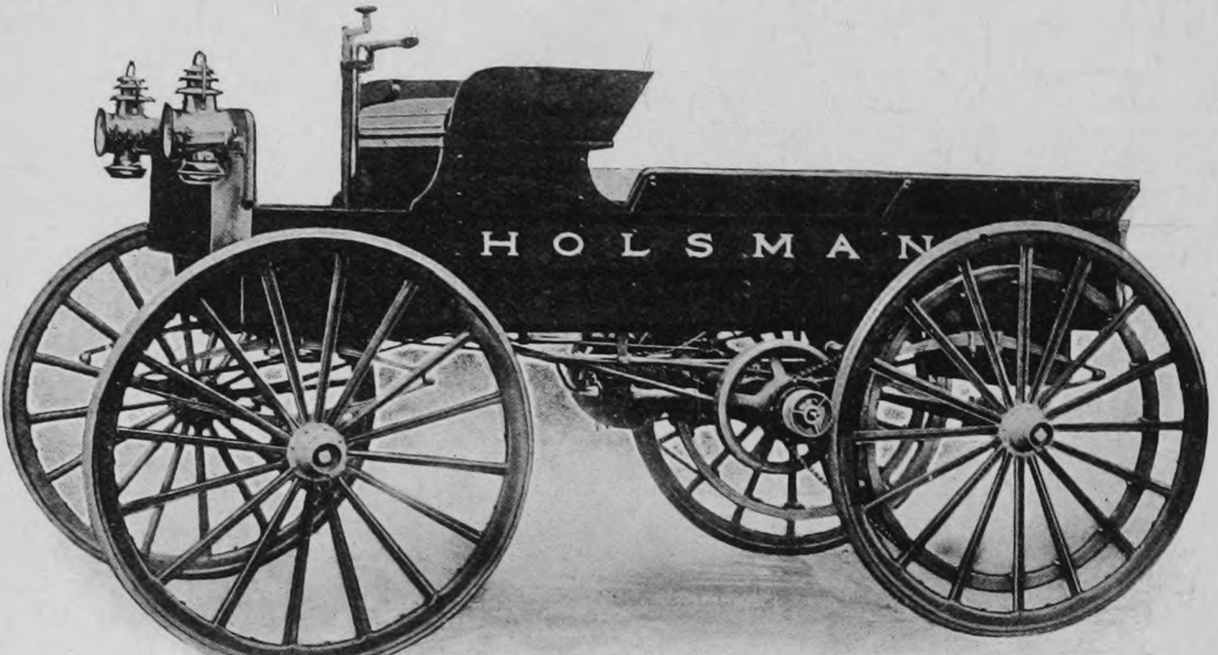
It is not unusual to see a light delivery truck taking car tracks at twenty-five miles an hour and sometimes this is done when loaded. No machine on solid tires will stand up any length of time when used in this way. The firm employing this driver is, of course, not aware of the speeds which he is accustomed to indulge in and is surprised at the fact that something is wrong when the truck commences to go to pieces prematurely. Such a failure is of course attributed by the user, to poor material or workmanship, the manufacturer getting the blame.

Joy riding is usually supposed to be limited to the use of pleasure vehicles, but when the facts are known it is found that this is far from the case. Many a truck is overworked and overspeeded, especially trucks of the lighter type, by being used for pleasure rides, machines fitted with two seats are often made use of by others than those connected with the business, the passengers distracting, to a certain extent, the attention of the driver whose whole attention is in reality needed, when taking the truck over slippery pavements and through crowded streets.

There sems to be but one solution to the problem, that is some form of automatic regulator on the engine speed so adjusted and locked that it cannot be tampered with by the driver, or the use of a recording device, safe guarded in the same way from being made inoperative by the driver. As the manufacturer is usually the one who receives the blame for all unusual failures, regardless of their cause, the use of such recording devices will doubtless appeal strongly to the makers and it is only a question of time when such devices will be made a part of the truck's regular equipment, thus making a strong selling point in the machine's favor and at the same time protecting the manufacturer.

Three Coppock taxicabs have been put into service by the Frank Bird Transfer Company of Indianapolis, Ind. If these prove to be a success a motor truck delivery service will be established.

ure and commercial cars, the Holsman Automobile Company, of Chicago, Ill., made some very radical departures in the general principles of construction as seen in the machines turned out by this company in years previous to 1909. Among these radical changes may be mentioned the direct drive from the motor shaft to the wheels without any intermediate gears of any kind; the substitution of a nickel-chrome naked friction chain for the old cable; and the designing of a 4-cylinder motor. This is claimed to be the only motor manufactured in which every bearng is either a ball or roller bearing, and in which friction bearings are entirely eliminated. Automobile dealers and the utomobile buying public have watched ith interest the working out of these rinciples.



"1910 Holsman" Model 14 delivery wagon mounted on a "Model K" chassis for $700 or on the "Model H" chassis for $900. Size of body, 40 x 96 x 9 inches deep. Carrying capacity, 1000 lbs. Description of the two chassis is given in the text.

The 1910 Holsman has already made its ppearance, and, excepting a few improveents and refinements in design and contruction, there are very few changes. he chassis of both the pleasure and comercial cars are the same, the only diference being in the bodies and the abence of the fenders on the commercial xcept where they are specified when they re charged for extra.

BODIES.

Three types of bodies are used. The Model 14—K" for $700 and the "Model —14" for $900, equipped with the 12¼ . P., 2-cylinder motor and the 26 H. P., cylinder all-ball-and-roller-bearing motor

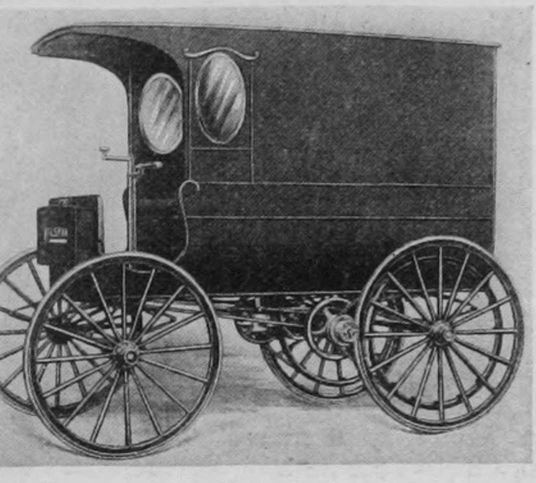
type and has the 4-cylinder, 26 H. P., a ball-and-roller-bearing motor. The sid are of wood panels and have oval windov in them as shown in the cut. The top a swell wood panel. The price is $1050 $1000 for the Model "H-14-P" which identically the same except that it has plainer body and windows. The capaci of these two models is from 800 to 10 pounds. The sizes of all commerci bodies are alike.

The Models "14-K-M" selling for $77 and "H-14-M" for $975, are of the partly open side type, having full moroccolin tops and a carrying capacity of 100 pounds. The first named has the 12 4- H. P., 2-cylinder motor, and the other the 26 H. P., 4-cylinder, all-ball-and-roller-bearing motor. Storm front and side curtains are charged for as extras.

The Holsman models are all equipped with "Sarven" patent 40-inch wheels in front and 42-inch in the rear, a reduction of 2 inches on the front wheels and 4 inches on the back, from the 1909 models. The tires are 1¼ inches, solid rubber and have a regular 56-inch tread with an option of a 61-inch tread, for $25 extra.

The axles are roller bearing both front and rear, and all the springs are of the full elliptic pattern. The bodies and running gears of the commercial cars are all finished in dark green, but other colors or combinations may be had for an extra charge of at least $5. The gasoline capacity of the delivery wagons is

r change gear parts or levers of any
except the foot brake lever. The ve-
e starts and runs on all ordinary roads
n zero to twenty-five or thirty miles
hour by friction of the steel chains
ating on grooved sheaves on the ends



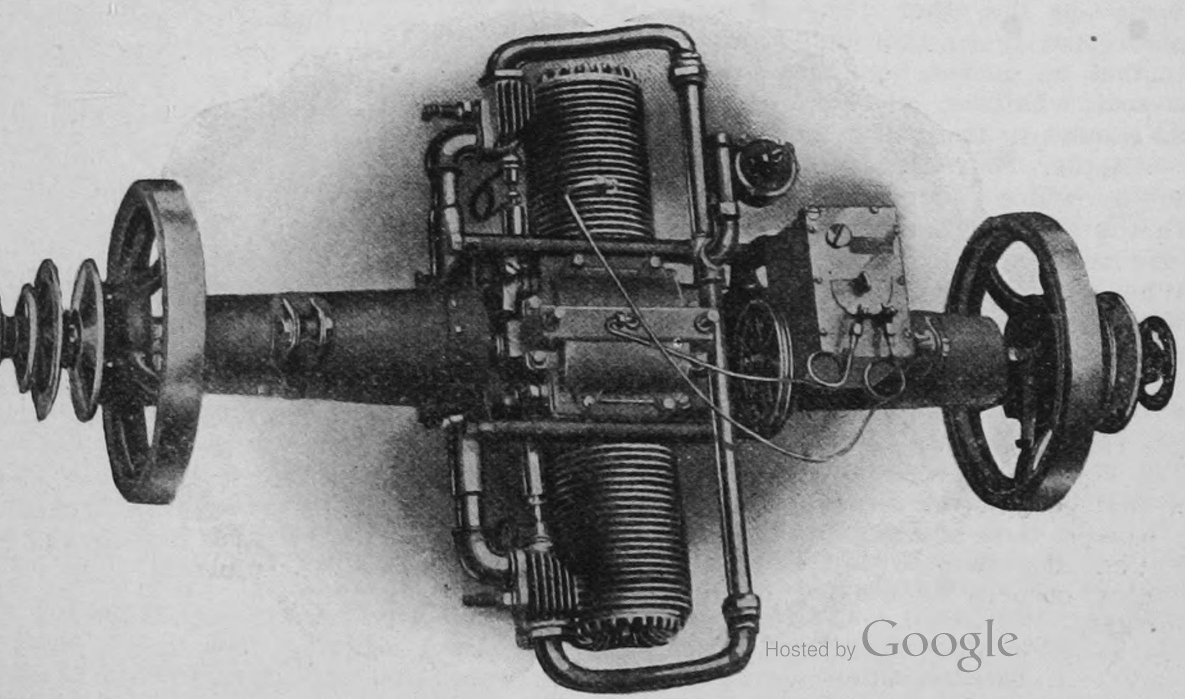
.0 Holsman" Model H-14-0 delivery wagon with 4-
26 H. P. all-ball-and-roller bearing motor,
well wood panel top, with oval windows as shown
t, size of body, 40x96 ins., capacity, 800 to 1000
price, $1050.
el H-14-P is similar to this model but has plainer
and windows, price, $1000.

ne motor shaft to the sheaves on both
wheels. In case of steep hills or
, sufficient to stall the motor on high
d, the low speed comes into action by
gement of sprockets on the motor
t with the chains, and, the necessity
greater power having passed, the high
returns automatically into operation
simply relieving the tension on the
ns by the control lever.

the steel channels or rims of the wheels, by the same control lever. The driving chains are wholly and automatically raised from engagement whenever the tension on them is relieved or the brake is set, or whenever the reverse is in action. This is the only device by which an automobile may be instantly and positively reversed without any extra machinery.

Thus all operations of driving forward, backward, slow, or fast are accomplished with power direct from the motor shaft to the wheels through the patent friction chain without the intervention of any countershaft, or jackshaft, or any machinery whatever.

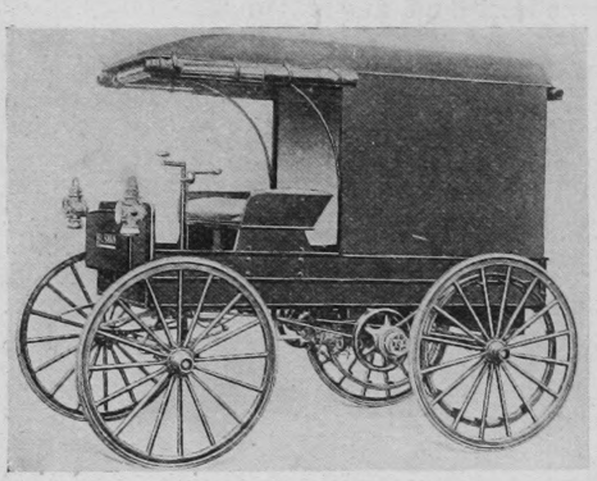
The transmission chains are specially constructed of hardened nickel chromium steel under patents. The Holsman Company guarantees them to be as durable and to wear as long as any other type of chain used on automobile transmission to the driving wheels, and their efficiency to be unaffected by water, snow, mud, or any other road or weather conditions, and that they are no more liable to be dislodged than any other transmission chain applied to automobile wheels. They run in deep sheaves and enter the rear sheave on the down side 15 inches above the ground, thus making it quite impossible to throw them off in deep ruts, snow, mud, or sand. The chains run absolutely noiseless on high gear, and on low gear make only the same sprocket engagement sound that any good roller chain makes. When in driving action they are in tension both ways, thus making the steadiest drive for such work.



side rim of the wheel, where the power is needed, instead of on or near the hub or on the axle, thus making light wheels and running gear efficient and durable.

CONTROL.

The "Holsman" special patented anti-rattle and non-wearing steering joints are used throughout. The steering control post is placed in the middle about 8 inches in front of the seat. This post contains all the control elements for forward movement, high and low speed, and reverse.



"1910 Holsman" Model 14-K-M delivery wagon with 2-cylinder 12 4-5 H. P. motor and moroccoline top, size of body 40x96 inches, capacity 1000 lbs., price, $775, storm fronts, $15 extra.

This body is also supplied on the 4-cylinder, 26 H. P. all-ball-and-roller bearing motor chassis for $975.

The steering and control levers are so designed that they can be turned either way, so that the vehicle not only can be entered as readily from one side as the other, but can be operated as readily from one side as the other. The steering and control post is so thoroughly out of the way that no encroachment is made upon the seat whatever, and one can readily pass around in front of it or even behind it. Another convenience is the arrangement by which the motor can be started with the starting handle from either side of the vehicle.

When fenders are ordered they are applied so that the front ones turn with the wheels, thus constantly protecting the vehicle or preventing contact of the tire of the wheel with the clothing at whatever angle the wheel may be turned.

The lamps are attached to the same device that permits the fenders to move with the wheels, thus pointing the lights in the direction the vehicle is to turn when rounding corners or seeking out crooked roadways.

THE 26 H. P. 4-CYL. ALL-BALL-AND-ROLLER BEARING MOTOR.

and high gear all in one piece. It three 5-inch radial ball bearings of best silent type, two 5-inch roller bearin of the best frictionless type, and two Hy flexible roller bearings at the end of shaft near the sheaves. It has no pl bearings or journals whatsoever, not ev a piston wrist-pin bearing. The Holsm Company claims the ball and roller be ings used are fully twice as large as ha ever been used on any motor of the sa capacity, and are intended to be practic ly non-wearable.

The inlet valves are automatic and made in one piece from solid steel, pr tically non-wearable. The exhaust valv are operated direct from the motor sh without any intermediate machinery, su as gears, push rods, etc., and are also signed to be practically non-wearal There are absolutely no gears in motor.

The motor cylinder and bearing lubri tion is accomplished perfectly, with any oiler pump or other machinery, dissolving the requisite amount of lu cating oil in the gasoline, whence it is c ried in vapor form directly to all the pa and perfectly distributed without chance of failure to lubricate properly. oil adjustment or anxiety is necessa and the motor simply cannot fail to ceive the proper quantity of oil in prop tion to the work required of it. This s tem also prevents the oil from getting over the motor and leaves a perfec clean motor to work around in case necessity.

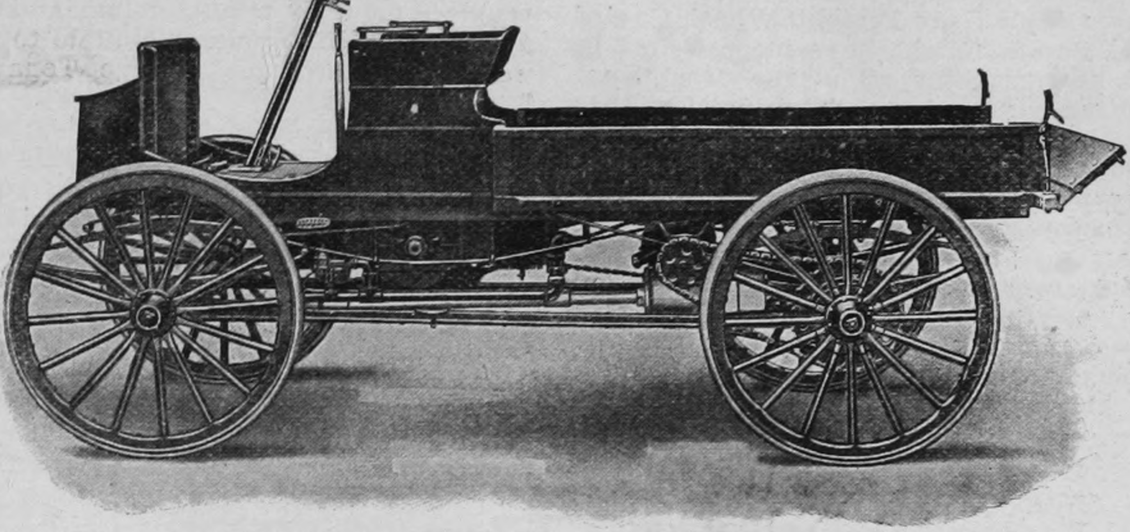
THE 12 4-5 H. P. 2-CYL. MOTOR.

The 12 4-5 H. P., 2-cylinder motor u in "Holsman" type "K" models has 4 inch opposed cylinders of the 4-cycle ty It is air cooled and has adjustable conne ing rod bearings. There are no gask used on this motor, the cylinder he screw into the cylinders and are easily moved and quickly replaced. The m bearings are of the adjustable frict type made from the best of material.

EQUIPMENT.

Equipment for Type "K" models c sists of two sets of dry batteries, set tools, one gallon cylinder oil, rubber f matting, horn, and two brass keros lamps. Fenders are optional at an ex charge. Model "H" vehicles have same equipment with a storage battery place of one of the dry cell sets.

Boston now has twenty-six automobi engaged in municipal work. The pol and fire departments each have six ca the street cleaning department three a th water and bath departments two ea



The "McIntyre" Model 251 Light Delivery Wagon.

"McINTYRE" MODEL 251 LIGHT DELIVERY WAGON

The cut herewith shows one of the most
pular sellers manufactured by the W.
McIntyre Company, of Auburn, Ind. It
their Model 251 Light Delivery Wagon.
The motor is a double cylinder, horizon-
opposed, 4¾ bore and stroke, giving
H. P. The transmission is of the plan-
ry type, giving two speeds forward and
e reverse. The drive is by chain to
th rear wheels. Contracting band
akes are fitted to both rear hubs. The
er is by wheel and the spark and throt-
levers are on top of the steering post.
e high speed and reverse are operated
side lever and the low speed and brake
pedal. Mechanical lubrication is em-
yed; the carburetor is of the float feed
e. Ignition is by the jump spark sys-
n, using dry batteries. The frame is
x¼ in. angle iron, hot riveted, 32 in.
le by 112 in. long. Four full elliptic
ings are fitted, 1½ in. wide, 5 leaves in
nt and 7 in rear. The wheels are 34
Sarven pattern. The axles are fitted
h roller bearings. The front axle is
in. square and the rear axle 1½ in.
are. The wheel base is 86 in. The
es are solid rubber 1½ in, in front, 1¾
rear. Outside dimensions of body are
x48 in., inside back of seat 68x45 in.
e panels are 8 in. deep inside. The
ly is ironed on top all around and strap
ns are fitted on bottom. A drop end
e is provided. A tool box is placed on
dash. The capacity of the machine is
00 pounds and the price $750.

ix Cartercar taxicabs have been put in-
service upon the streets of Tacoma,
sh., by the Pacific Car Company.

"QUICKER SERVICE AT SAME COST"

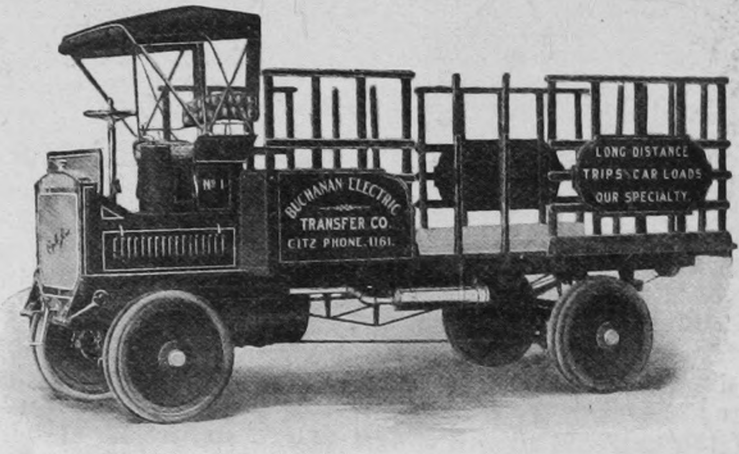
Such is the statement made by the Columbia Grocery Company, of Indianapolis, Ind., who has been using a commercial motor car in delivering groceries for the last two years.

This concern has in service a 24 H. P., 4-cylinder Rapid motor truck made by the Rapid Motor Vehicle Co., of Pontiac, Mich., listing at $1600. Covering a radius of about five miles this car makes five trips of about thirty calls each. A load of about 800 pounds is carried each trip. Formerly, two single delivery wagons were used, each making three trips of twenty-five calls each under a load of about 600-700 pounds. The first cost of the motor truck was about three times that of the two horses, wagons and harness formerly used, but the cost of maintainance is slightly less and the service much quicker. The monthly cost for both delivery wagons was about $130, which is the average monthly cost of the motor truck. The car is kept at a garage at a storage rate of $15. The operator is paid about $50 per month, the cost of gasoline and oil averages about $35 per month and the monthly cost of repair work and parts is $20.

The Columbia Grocery Company states that all requirements, except the desired lower cost, are fulfilled. The company thinks the investment involved in installing a motor truck is too great, considering the quick depreciation, as the life of the car is estimated to be only about five years. They have had no trouble whatever in securing competent drivers, and the most needed improvement suggested by this company's experience is better working and simpler motors and a lower first cost.

The Couple-Gear Freight Wheel Co., of Grand Rapids, Mich., have incorporated in their new machine all of the "couple-action" and "couple-gear" principles that have been incorporated in the battery driven machines since their beginning. In this type, however, they have substituted the motor generator set in place of the battery.

The power on a 3½-ton wagon consists of a 4-cylinder, 4-cycle, 5-inch bearing engine and 12½ K. W. generator direct connected and carried on a sub-base which has three-point suspension within the main frame. This outfit generates current as needed which is conducted to the controller and from there to the motors in the wheels.



The 1910 Couple-Gear Truck.

SIMPLE CONTROL.

The controller is built with two changes of speed, and all other changes are made by increasing and decreasing the speed of the engine which is controlled entirely by an inward motion of the left foot, leaving the hands free at all times to operate the steering device. The speeds of the car vary from 7 to 15 miles per hour and over all ordinary roads it is possible to use them in connection with a trailer, handling the full rated load capacity upon the truck and a like amount upon the trailer.

TESTS MADE WITH THE COUPLE-GEAR TRUCK.

We give herewith a report of a 7-ton load delivered from Buffalo to Tonawanda by the Dold Co., also report covering cross country trip made from Grand Rapids to Battle Creek with one of the 3½-ton machines.

The Dold Company's truck carried a 7-ton load, 14,000 pounds weight of load, and 4500 pounds weight of trailer. The number of deliveries, mostly at retail markets, were 28; total mileage, 38; average speed, loaded, to first stop, 8.5 miles per

wanda, 1 hour 59 minutes; maximum v
age, 125; average voltage Buffalo to To
wanda, 125; average voltage Tonawa
to Buffalo, 110.

In the afternoon of the same day 25
liveries were made to city markets co
ing a distance of 17.7 miles in the runn
time of 2 hours 19 minutes, and total t
of 4 hours 45 minutes.

The cross-country trip was made afte
severe rain and the roads encountered
the first 20 miles were very bad.
tread of this machine was 66 inches, m
ing it necessary for the machine to
its own way through the mud, sand
other obstructions that were continuo
met with. The entire trip was made w
out a mishap of any kind and at no t
was there a lack of sufficient power
take the machine through with a g
road.

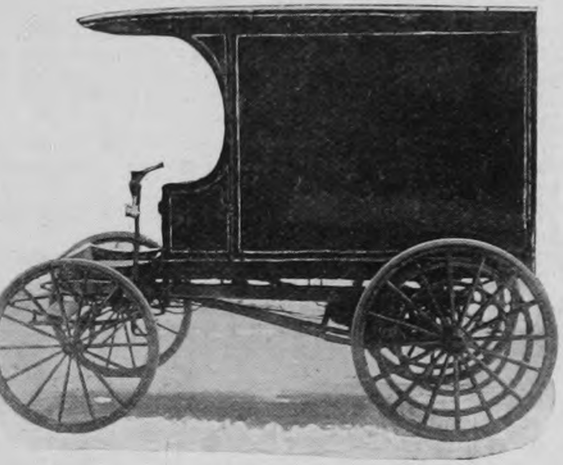
The total distance was 144 miles. Fr
Grand Rapids to Kalamazoo the dista
was 48 miles. Running time 5 hours
minutes; miles per hour, 9; gasoline c
sumed, 14½ gallons; miles per gal
3.31; average voltage, 125; average
peres, 83.

Twelve gallons of gasoline were u
in a half day demonstration at Kala
zoo. The 24 miles from Kalamazoo to
tle Creek were made in 2 hours 16 min
half day demonstration was also given
Battle Creek. During the last half
demonstration 11½ gallons of gaso
were used. The return trip to Kala
zoo was made in a running time o
hours 30 minutes; total time, 4 hours
minutes; miles per hour, 10.75; gaso
used, 5 1-3 gallons, and total amount
oil per trip, 4 gallons.

The city of Pomona, Cal., has put

ercial vehicle built on order by Chas. E. ryea, of Reading, Pa., for a West Indies kery company.

The wheels, tires, axles and springs are avier than used in the regular buggyauts t the system is identical. The driven gs are slightly larger thus securing a ver gear with more powerful drive. The in difference shown in this car is the ation of the control and the driver's seat. is is at the extreme front as in a horse



The "Duryea" Commercial Car.

awn vehicle and so leaves the entire dy of the car available for carrying mer- andise. Business men having goods of ht bulky character will appreciate this ded space. The driver mounts from in ont and as the control is at one side ere is nothing in the way to prevent him om loading or unloading at this end also. is is a decided saving of time as com- red with that required to run to the rear d, open doors, take out the parcels and se the doors, as is commonly done. It well-known that for short trips the time st at the stops is the most expensive item d this arrangement which permits handy cess to the goods from the front without ing around the rig or opening and clos- g doors is a decided time saver. For ormy weather the front may be protected a transparent apron and the operator n mount and dismount at the sides. hen stopping the cross lever can be rown up to a vertical position and thus not in the way of the operator. This odel like all other Duryea vehicles uses clined steering heads which take off the rain of steering fully and make a lever eering not only easy but safe and more ndy than a wheel. Tests have shown peatedly that removal of the tie rod leav- g one wheel free, does not result in acci- nt but that the free wheel will follow the maximum speed is about 18 miles per hour. The fuel tank is quite large and with the cells and coil is under the driver's seat. These are sometimes hung under the body leaving the space under the seat clear for parcels. If desired the seat can be removed so as to permit loading at the front goods too heavy to easily lift over the seat. The arrangement shown is believed best for light merchandise such as laundry, flowers, shoes, drygoods, hats, millinery and similar businesses. The price is somewhat dependent on the load to be carried and the finish of the body but runs about $750 generally.

FRONTENAC TRUCK

The Frontenac commercial trucks have been doing exceptionally good work during the past year, and from now on, the Abendroth & Root Co. intends to pay considerable attention to the commercial field. The firm's specialty in the commercial line is a three ton truck, fitted with a Frontenac motor developing 50 H. P. The cylinders are 5x5¾ inches giving 1,000 revolutions per minute. The Abendroth & Root Company have such faith in their motor that they estimate the life from eight to ten years, if given proper care. The wheel base is 122½ inches, with a 58-inch tread. The chassis weighs 5,300 pounds without the body. The frame is made of eight inch channel steel, while the unusually strong rear axle is three inches square. It is claimed that in actual test with a heavy load, the Frontenac three ton truck will travel six miles with one gallon of gasoline, and 75 miles on one gallon of lubricating oil. The Frontenac chassis for commercial cars is listed at $3,500.

ELECTRIC TRUCK IS HORSE'S FRIEND

Officers of the Cleveland Humane Society are declaring for the automobile as against the horse for heavy city hauling.

Statistics show that horses fresh from the farm are completely knocked out after three years of work on the hard city pavings, and then being unfit for the purpose for which they were purchased are sold to peddlers, movers, draymen, etc., who mistreat them in a majority of cases.

Dr. Friedrich, Cleveland health officer, says that in his opinion auto trucks are humane as well as useful and that he hopes to see the time when all heavy hauling will be done by them, leaving less arduous

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for electric dairy trucks in nearby Jersey towns.

ADVERTISES BUSINESS AND SAVES MONEY

A. Bell & Son, Reading, Ohio, dealers in groceries, fruits, vegetables, etc., have purchased a truck from the Sayers & Scovill Co., of Cincinnati, Ohio, at a cost of $1,000, and which they claim after three months' use, has not merely advertised their business, but has proven a saving to them.

The machine is of the double opposed type air cooled, and has the motor placed under the hood in front. The motor is rated at 16 horse power. The car, as a rule, is loaded up to about 500 pounds. One trip of about twelve miles is made per day, each trip averaging forty calls. They store the car in their barn.

This concern caims that it can deliver its goods with the auto on one and one-half gallons of gasoline a day, which at 14 cents per gallon, would be 21 cents, which would be considerably less than it would cost to feed a horse for one day. The average cost of lubricating oil per month is 75 cents.

A motor stage line between Blain and St. Clairsville, Ohio, is planned by the owner of the line which is at present operating between Mt. Pleasant and Wheeling, W. Va..

Ford taxicabs, which number will be incre
as fast as is necessary.

An automobile chemical engine was rece
put into service at Brockton, Mass. The
machine is a 40 horse-power Pope-Hartfor

Coffeyville, Kan., is to be provided with
service of motor cabs.

Motor bus service has been established
tween Gallatin and Dixon Springs in Tenne
The two points are 23 miles apart.

The sum of $4,000 has been appropriated
the purchase of a motor hose and chem
wagon for Lockport, N. Y.

An automobile stage line has been es
lished between Millersburg and Reading,
a distance of 25 miles.

The Robinson-Loomis Motor Truck C
pany, recently incorporated at $50,000,
erected a factory at Second Avenue, N,
Seventh Street, Minneapolis, Minn. The
commercial vehicle is to be known as
Gopher truck.

Motor cab service is to be provided in
bile, Ala. Four machines will be operate
the outset of the undertaking.

Eight motor cabs are operating in Pasad
Cal.

The Peekskill, N. Y., authorities have
cided to purchase a motor vehicle for the
department at a cost of $7,500.

A White steam hearse has been put
service in San Francisco, Cal., by Juliu
Godeau.

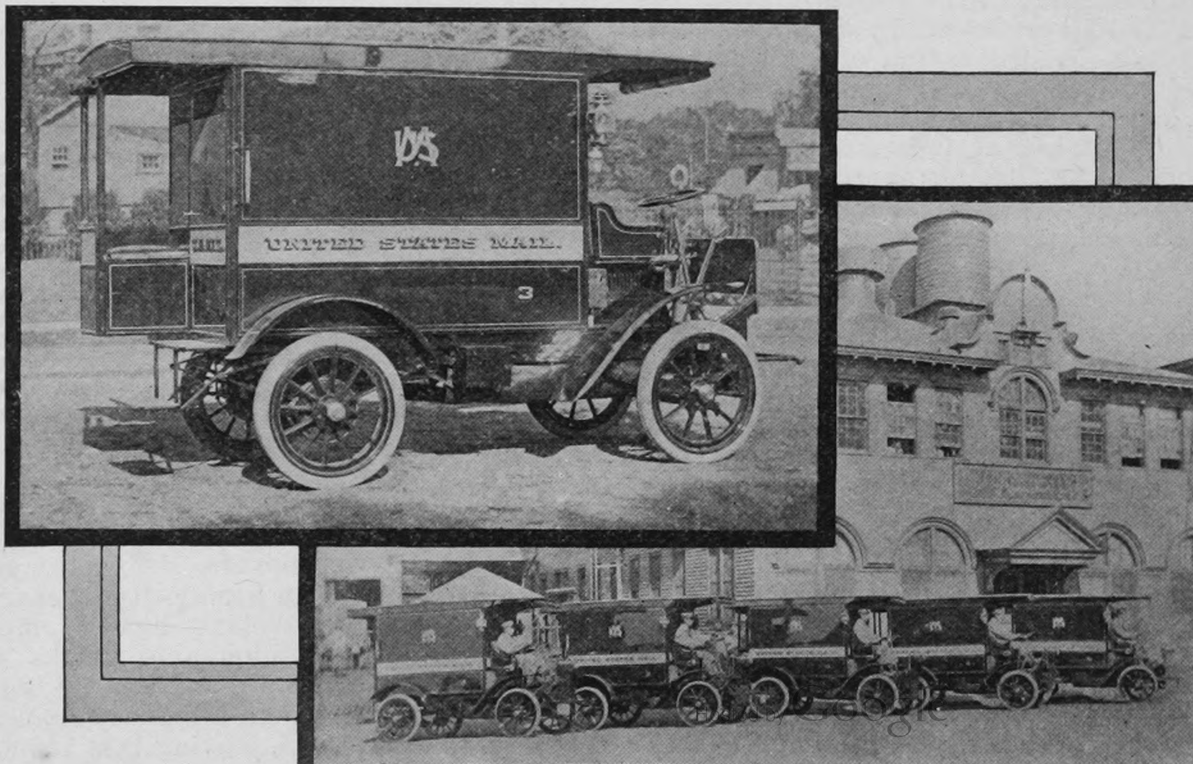
Motor cab service is to be supplied in
Joseph, Mo.

A motor patrol and ambulance will be
chased for the police department of St. Jos
Mo.

A sixty horse-power Pierce ambulance
been put into service in St. Louis, Mo.

An automobile bus service has been ina
rated by the Berks Auto Traffic Company
tween Reading and Bernville, Pa. Three r
trips a day are made.

A motor bus line has been put into opera
between Stirling City, Cal., and Prattville
Dr. R. S. Brown.



Hart-Kraft Business Wagons

The most reliable and economical delivery wagon offered for 1910

Actual Experience is Proof of Our Claim

Read the following condensed report of a Hart-Kraft Wagon which was operated from 22nd St., New York City, to Mt. Vernon, Pelham, New Rochelle and return DAILY. The wagon contained two men and the number of packages indicated by the deliveries. Gasoline figured at 15 cents per gallon; oil at 40 cents.

Total miles	71 days, 4014½	Total average one day,	56.5 miles
" deliveries	" 3175	" " " "	46 deliveries
" gasoline used	" 317½ gals.	" " " "	4½ gallons
" oil used	" 124 pts.	" " " "	1½ pints
" fuel cost	" $53.83	" " " "	$0.76

Fuel Per Mile for Whole Period:

12½ miles per gallon of gasoline **37½ miles per pint of oil**

The Hart-Kraft Wagon

Has Unit Power Plant, Magneto Ignition, Timken Bearings, Planetary Gearing, Multiple Disc Clutch, Double Opposed Motor, Water Cooled. Full Elliptic Springs. Double Chain Drive, Solid Tires.

All parts of the Power Plant are easily accessible from the Driver's Seat.

Special Bodies of Selected Design made to suit Customers.

Capacity, 1000 pounds.

HART-KRAFT MOTOR CO.
YORK, PENNA.

EASTMAN KODAK CO. USES GASOLINE TRUCK

The Eastman Kodak Company, of Rohester, N. Y., the well known manufacurers of cameras and photo supplies, are sing a 24 H. P. Frayer Miller truck for eighting purposes. The car has been use about a year and makes an averge of eight trips daily between two facories, which are about three miles apart.

The average weight of load carried on ach trip is about 2½ tons. On an averge of 48 miles are made per day. The verage monthly cost of gasoline, per car, s $24.08, and of lubricating oil, $9.23. epair work, repair parts and cleaning re figured at $80.81 per month. This oncern stores the car in its own barn. he operator is paid $65 per month and e helpers $52.

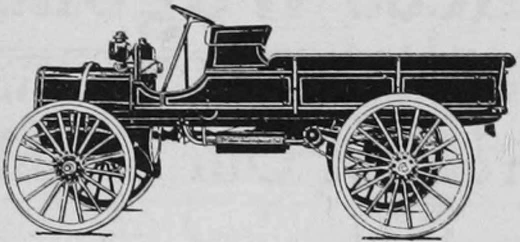
The motor truck replaced 3 2-3 teams. he teams carried on an average of two ons per trip and totaled about 52 miles aily. These teams were hired and cost 4 per day, including driver. The Eastman Company states that the gasoline ruck is better for long hauls, while the orse vehicle is better for short hauls.

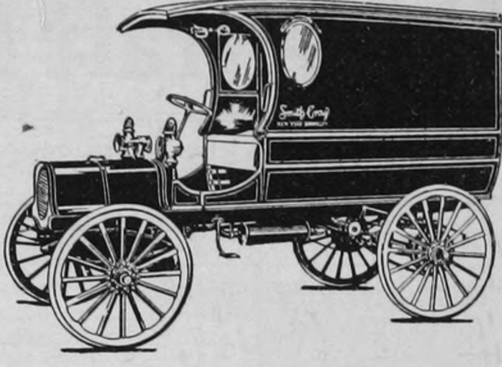
Two Marmon five passenger limousines have been ordered by the Horace Wood Transfer Co., of Indianapolis, Ind., for use in connection with their present horse livery.

The Washington and Brownsville Auto Passenger Transit Company, which is owned by the Forsythe Brothers, of Washington, Pa., has established an automobile service between Washington and Brownsville, with a 40 H. P. Grabowsky car.

A regular motor car line has been started between Fredericktown, Md., and Washington, D. C. The route leads through Brownsville, Centerville, Beallsville, Scenery Hill, Clyde and Pancake, a total of 30 miles. Two round trips will be made daily with a 45 horse-power, twelve passenger car of the closed type, heated and electrically lighted.

A taxicab service was recently installed in Baltimore, Maryland, by Harry L. Stewart, proprietor of the Stewart Central Stables. It is stated that $80,000 has already been spent in getting it started. The stables on West Eager street have been convert-

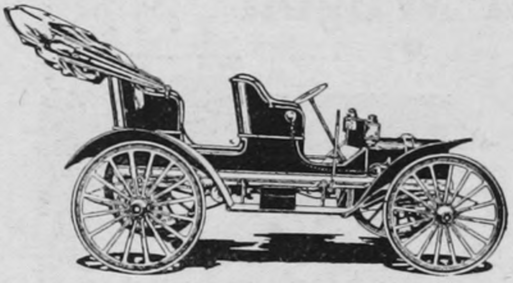




The Chase Motor Wagon

with its **wonderfully simple, air cooled, valveless** motor, high wheels, solid tires and enclosed planetary transmission is the most practical business wagon on the market—because it is dependable for every day service—is economical to maintain and simple to handle.

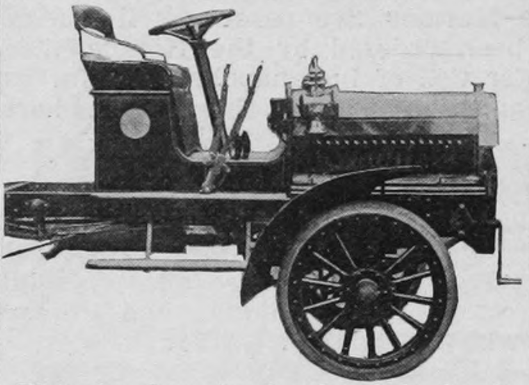
Prices, $750, $900, $1050



Our 1910 line includes the best high wheel Surrey ever built.

Proofs and Catalogue Mailed on Request

CHASE MOTOR TRUCK CO.
Syracuse, N. Y., U. S. A.



Write for photo showing the whole chassis
1910 Model M

"American"

worthy the name

3

Standard Chassis

3

"AMERICAN-TRUCKS"
LOCKPORT, N.Y.
"DELIVER THE GOODS"

Seal

MODELS "O" 5-Ton
"L" 3 "
"M" 2 " **ALL GOOD**

We are CLOSING Contracts daily for exclusive territory. **DEALER** you should investigate and secure our line.

Write me today.

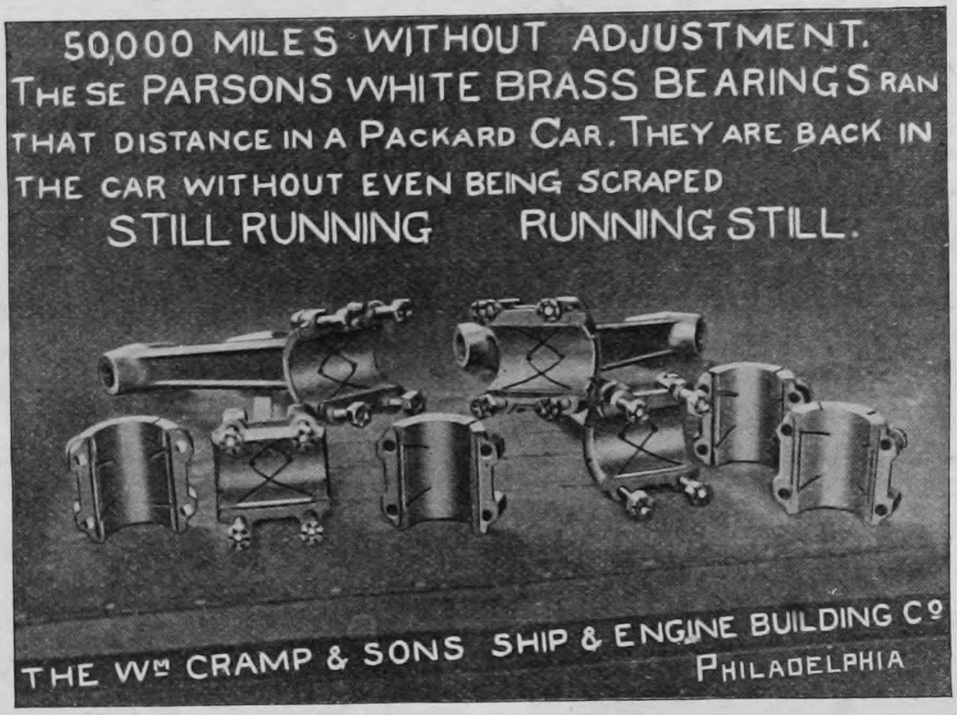
Sheet Metal Stamping *for* Automobiles

Brake Drums, Wheel Flanges, Hub Caps, Ball Cups and Retainers, Hood Supports, Step Hangers, Brake Bands, Gear Covers, Universal Joint Covers, Clutch Discs.

These are only a few of the principal parts we make for automobiles.

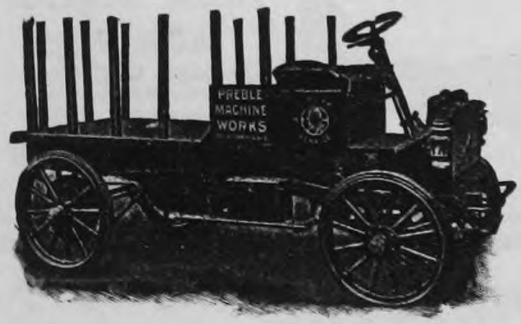
The Crosby Company, Buffalo, N. Y.

CRAMP



50,000 MILES WITHOUT ADJUSTMENT.
THESE PARSONS WHITE BRASS BEARINGS RAN THAT DISTANCE IN A PACKARD CAR. THEY ARE BACK IN THE CAR WITHOUT EVEN BEING SCRAPED
STILL RUNNING RUNNING STILL.

THE Wm CRAMP & SONS SHIP & ENGINE BUILDING Co
PHILADELPHIA



Applications for Agencies in unassigned territory considered.

The STRENUOUS RANDOLPH

A live proposition from every point of view. Built in capacities ranging from 1500 lbs. to 5 tons.

RANDOLPH MOTOR CAR CO.
175 E. RANDOLPH ST., CHICAGO, U. S. A.

Hewitt Trucks

LIGHT DELIVERY

Gramm-Logan

The "**World's Best**" Commercial Cars. In power and reliability, in strength, simplicity and efficiency

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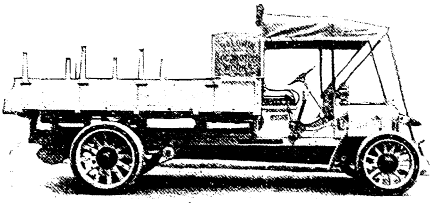


Commercial Motor Vehicles of every size and type, both Gasoline and Electric.

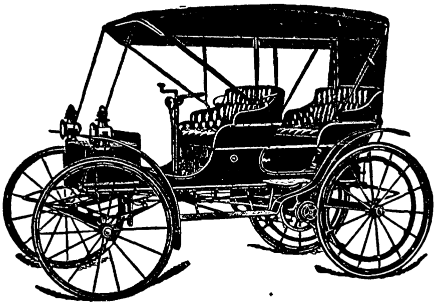
Specially built machines when required for unusual conditions of service.

Garage equipment for the proper care and maintenance of Motor Trucks.

The Commercial Motorcar Co.
Times Building, New York

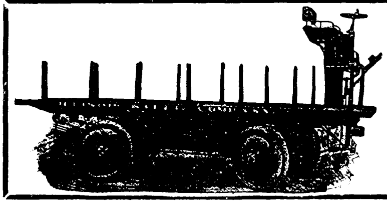
Holsman Automobiles

High Wheels Travel all Roads, Because all Roads are Made to be Traveled by High Wheels



OLDEST and largest makers of high-wheeled automobiles in the world. World's record for Hill-climbing and Reliability contests in this class. **Only all ball-and-roller-bearing motor made.** New friction-chain direct drive—no gears. **Road-ability** and **Reliability** are the reasons for high wheels and solid rubber tires. Send for our catalog and learn more about these popular, intensely practical vehicles and their low cost.

THE HOLSMAN AUTOMOBILE COMPANY
273 Monadnock Block :: :: Chicago, Illinois

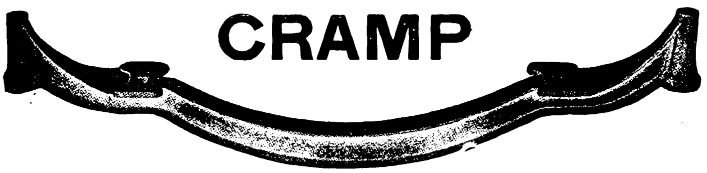


4-Wheel Drive Gas-Electric

(Something New)

Send for Catalogue. Agents Wanted.

COUPLE-GEAR FREIGHT-WHEEL CO.
560 BUCHANAN ST., GRAND RAPIDS, MICH.



CRAMP

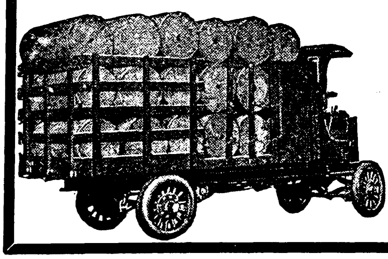
Parsons' Manganese Bronze Axles

Stronger than steel.
Thousands in use.
None have ever broken.

The Wm. Cramp & Sons Ship and Engine Building Company
Philadelphia, Pa.

Rapid

Commercial Power Wagons



offer greater money-making possibilities to the live agent or business man, with financial backing, than any other line. Rapid Commercial Power Wagons are built in sizes from ½ to 6 tons capacity, for any line of business. Every user of one or more horses represents a prospective buyer. See the possibilities now? Write today for catalog and agent's prospectus.

RAPID MOTOR VEHICLE COMPANY
211 Rapid St., Pontiac, Mich., U. S. A.

To Agents of High Class Cars

The Pierce 30 for 1910=$1750

¶ **Here is a car for those who are thinking of paying from $3000 to $4000 for a strictly high-grade car, but who are either not ready to pay that price or who are not fully convinced of the need of it.**

¶ In this PIERCE 30 the chassis, the springs, the body, the wheels, the furnishings and the accessories—all are of the grade that is only found (if at all) in a few of the highest priced cars on the market.

¶ There is not only refinement in both appearance and style, but this refinement is **substantial** and not of the **superficial** soon-wear-off variety.

¶ Agents well know that the demand for cars of this character, at a **fair** price, is greatly in excess of the supply.

¶ The PIERCE 30 is made at Racine, Wisconsin, by the Pierce Motor Company and was designed by A. G. Pierce, internationally known as the designer and manufacturer of the famous PIERCE engines. The engine Mr. Pierce has built for this 1910 car is one of the most quiet-running, simple and powerful 30-horse power engines ever put into an American or foreign car.

Guaranteed for One Year

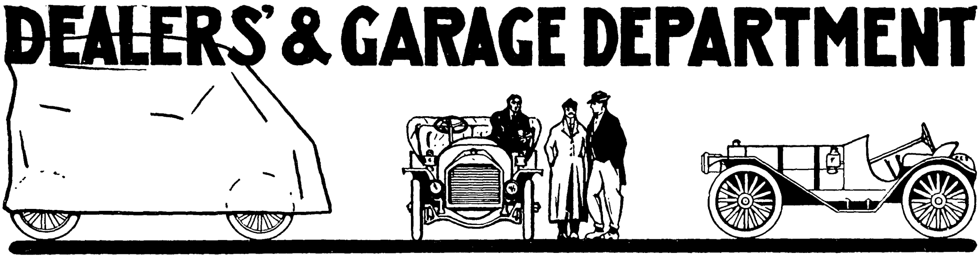
¶ The PIERCE is the only car on the market that is covered by a **full year's** guarantee against defective parts, which is the best possible proof of its superior quality.

¶ Only a few of these cars will be made for 1910 and agents who are interested are requested to write or wire us immediately.

PIERCE MOTOR COMPANY
RACINE, WISCONSIN

MANUFACTURERS OF ENGINES FOR OVER 25 YEARS
AND OF AUTOMOBILES FOR OVER 15 YEARS

DEALERS' & GARAGE DEPARTMENT



EDITORIAL

SO-CALLED CO-OPERATIVE LEAGUES

There is a tendency on the part of nearly all buyers to embrace any opportunity which looks like getting something for nothing. This is always a bad policy and usually ends in disappointment as one wit put it, "Whenever I am approached by anybody with, a something for nothing plan, I hold on to my pocketbook." All such schemes are sure to obtain from the victim more in the end than the purchase price of whatever is offered.

In the automobile field has appeared from time to time, societies or leagues, supposed to be of a co-operative nature, which hold out rosy hue inducements to the unwary car operator. These societies are supposed to be composed of local users who by buying large orders of goods at one time are enabled to get reductions which the individual buyer could not expect. At first sight this appears very plausible but investigation brings to light this is not the method of procedure and in nearly every case there are a few reaping the profit on the membership fees. The name of each influential member obtained is made use of to induce the local dealer into sharing his already meager profit with the promoters of the scheme.

Reputable manufacturers are very careful not to sell their goods through such channels and the grasping purchaser often finds that there is not such a discount to be had on standard automobile accessories as he was led to believe and, furthermore, is confronted with being unable to obtain discounts of any kind, except from a very few dealers who have been so eager for sales that they were willing to split their commission with others.

In the long run it is found that damage is being done to the dealers, the individual purchaser is coerced into buying goods at a limited number of places and when touring or out of a certain neighborhood is unable to get supplies at a discount as he believed would be possible, and a few on the inside are making a good thing out of his eagerness to get something for nothing.

This is a matter which should be carefully investigated by the Dealers' Association and measures taken to protect themselves against unscrupulous dealers who indulge in this form of price-cutting.

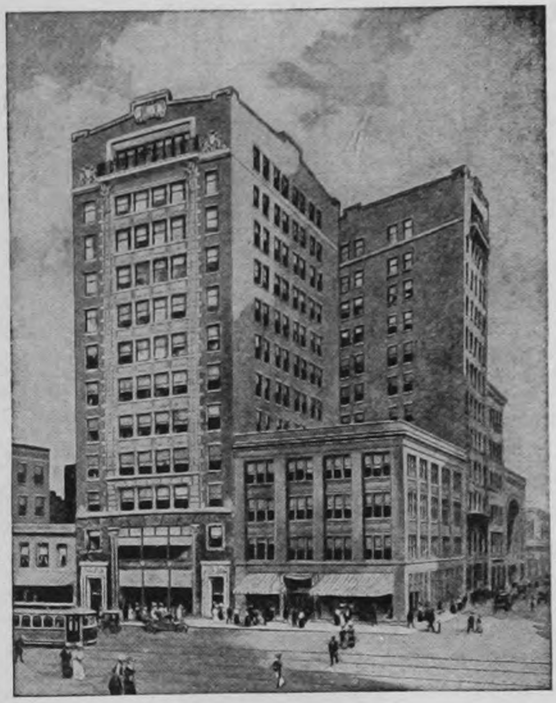
N. A. A. M. OBTAIN BETTER AUTOMOBILE SHIPPING RATES

Dealers, manufacturers and the public will be interested in the announcement made by the General Traffic Department of the National Association of Automobile Manufacturers, Inc., to the effect that after October 1st shipments of single automobiles will be charged for by the railroads on an actual weight basis instead of fixed minimum weights. Heretofore the railroads have charged 8,000 lbs. at first class freight rate for any passenger machine with wheel base exceeding 86 inches. As many, and perhaps most, of the low priced machines nowadays have wheel base exceeding 86 inches, there has been much complaint against the charge of 8,000 lbs. on these machines when shipped by freight. The advantage claimed for the new arrangement is more equitable distribution of the transportation charges, so that the smaller machines will hereafter be taken at the equivalent of 5,000 lbs. at first class, and the charges increased only as the weight, size and value increases, the point being made that automobiles are of substantial and varying weights. Similar change will be made on shipments boxed or crated, on which actual weight will apply instead of fixed minimum weights of the packages. The new classification affects shipments originating in the Northern States east of the Mississippi River, thereby including practically the entire manufacturing belt.

The National Association's traffic department effected an arrangement on a similar basis with Western and Southern railroads some time since.

The Hoyt Electrical Instrument Works have bought a piece of land fronting on Main Street, Penacook, N. H., which forms part of the Central Trunk Boulevard being built through the White Mountains, and will erect a modern, fireproof garage and salesroom.

The B. F. Goodrich Company of New York, has just finished, in New York City, ne of the most admirably equipped uildings for the handling of their rubber products, especially tires, that there s in America.



The new 12-story building, 1780-82 Broadway, New York City, recently completed by the B. F. Goodrich Company.

The structure is a notable addition to the business buildings of the neighborhood where it stands, Broadway, next to the corner of Fifty-seventh street. The building is numbered 1780-1782 on Broadway, and has an ell of almost equal size at 225-227 W. Fifty-seventh street. There are twelve floors and a basement. The latter is used entirely for the storage of automobile tires. The rear of the ground or street floor, is a receiving and shipping room. The front is a large salesroom, which has been very effectively done in mahogany. Green marble is also an element of the finish. It has been chosen for the counter tops and the heavy pillars that support the ceiling.

On the second floor, looking out on Broadway, is the reception room. There are large easy chairs, smoking tables, and convenient writing desks. The finish here is fumed oak. A rear room is reserved for the solid tire storage and repairing. Here is a complete wheelwright and forge equipment, so that all tire fitting can be done, as well as the repair work.

The eighth floor has been given over mostly to offices for the manager and

specialties such as druggists', surgeons' and stationers' rubber sundries.

The twelfth floor is given over to a most complete automobile tire repair department.

No mechanical device for the ready handling of the heavy stock has been omitted. There are special automobile elevators. One of these has the convenience of a turn table floor. There is also a general freight lift. In addition, two passenger elevators are provided, and an electric dummy waiter, adjusted to stop automatically at any floor.

The exterior of the building is white and green marble, with bronze capitols and decorations, for the first two stories. Above this, the material is pressed brick with white stone trimmings.

STUDEBAKER BRANCH MANAGERS TOUR FACTORY IN AUTOS

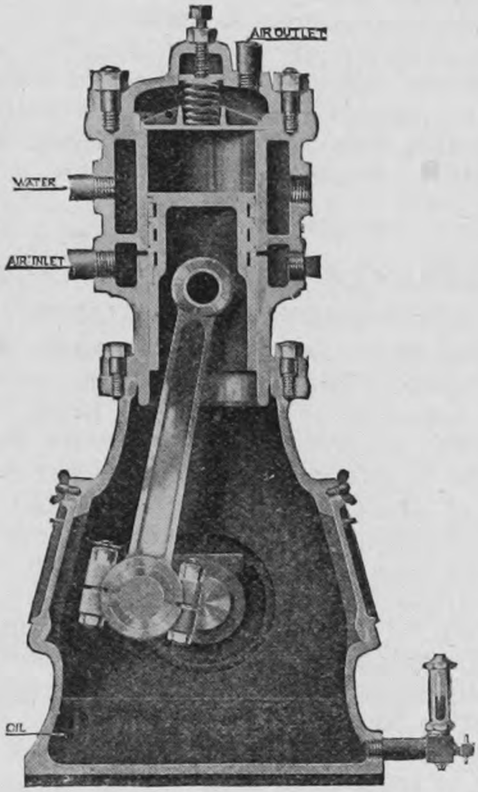
Twenty-four Studebaker Branch Managers spent a profitable week in their annual convention at South Bend, Ind. While the week was taken up with purely business matters, there was a pervading spirit of elation as it is claimed that during the past year Studebaker automobile business has increased in volume from two million to over forty million dollars and that through the Studebaker branches are now being marketed more automobiles annually than through any other single organization in the world.

Among other incidents of the week was a tour of inspection in Studebaker electri cars through the mammoth carriage an wagon factory at South Bend. The buildings are mostly four and five stories high The tour of inspection of each floor an over the system of tramways which ru over the roofs and connect the variou buildings, covered a distance of a littl more than 24 miles. Obviously such a tri could not be made even in a day on foo By the use of electric vehicles, howeve using the big elevators to ascend from on floor to another and then driving throug the entire labyrinth of aisles on each floo ascending to the next, and finally to th roof, the trip was made in one afternoo with plenty of stops for careful inspe tion of methods and models.

Morgan & Wright, of Detroit, Mich., a nounce that their Minneapolis branch now in new and more commodious qua ters, at 911 First avenue, S.

COMPRESSOR

The Gardner-Governor Company, of incy, Ill., is manufacturing a line of sin- and double vertical high-speed air com- essors, designed specially for garage use. e single cylinder compressor which is strated herewith is known as style G, l its cylinder dimensions are 3x3½ hes. This compressor is of the vertical e and has a capacity of 8 cu. ft. of free per minute. It is single acting and self- ng.



he "Gardner-Rix" Style G Air Compressor for garage Interior view.

The air is admitted through an annular rt in the air cylinder, located at the ver end of the piston travel. The small- size (3x3½) has no inlet valve; the her sizes have inlet valves in the air pis- ns. The air piston is of the trunk pat- n, equipped with spring rings, and is gle acting—i. e., it compresses the air the upward stroke only. The discharge lve is a flat casting and seats on the top l of the cylinder. The air piston com- tely fills the cylinder on each upward oke, so there is absolutely no clearance l the highest volumetric efficiency is at- ned.

The crank case or frame of the compres- is of the enclosed type with convenient nd-hole plates on opposite sides for ac- s to the connecting rod boxes. Glass l's-eyes are fitted in these plates so that attendant or operator may look into

pressor are white bronze renewable sleeves, and can be easily replaced when worn. Air cylinder is water jacketed.

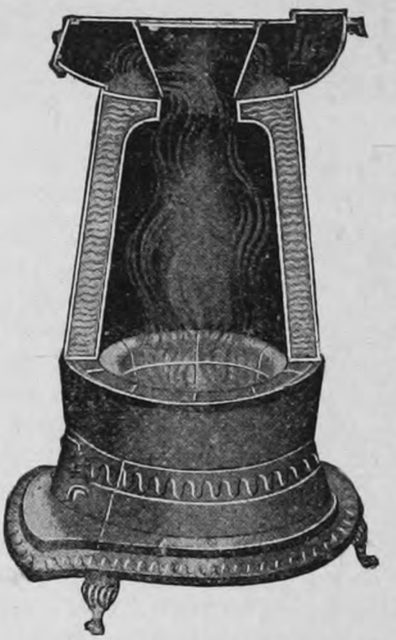
This machine takes up very little floor space and weighs 150 pounds. The pulley furnished is 14x2½ inches. It is claimed that this compressor is capable of working up a pressure of 250 pounds per square inch, if necessary. It lists at $40.

"GARAGE" HOT WATER HEATERS

The Garage Heater Company, of Syracuse, N. Y., is putting on the market a line of hot water systems for heating garages and cleaning cars.

The "Garage" heaters are simple in construction and consists of three parts only, the base, grate and water cylinder. They are made of cast iron, and with proper care will last a lifetime.

One of the accompanying illustrations shows half sectional view of the heater. the cylinder shown contains the water which circulates through the system.

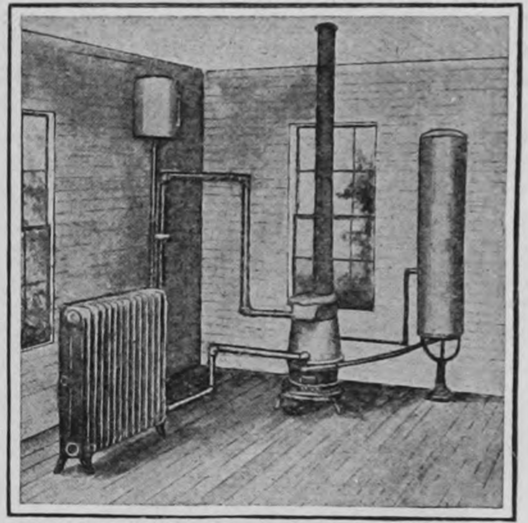


"Garage" Heater No. 3 installed. This heater heats the garage and supplies enough hot water to wash the car.

This cylinder is so constructed that the fire plays on every part and which makes the heater quick to respond and is operated on the minimum amount of fuel.

The heater is fed through the top like an ordinary globe stove and is self-cleaning as the action of the fire is against all parts and consequently allows no soot to collect but burns it off the surface. The pot is deep, which gives the full value of each unit of heat, and the gases are all leaning is done with ease.

The other cut shows the "Garage" sys-em No. 3 installed inside the garage. It an be installed in the basement or outside he building entirely and the piping rought from the heater wherever it may e set to the radiator and reserve tank. This heater will not only heat the garage o 70 deg. in zero weather, but also fur-ishes enough hot water to thoroughly lean the car. The operation is from one ire, which in this size heater is twelve



Interior view of the "Garage" heater showing the cyl-nder which supplies the hot water for warming the gar-ge.

nches in diameter, and the fuel consump-ion is very small. During the summer nonths a few pieces of wood heats water nough to clean the car.

The difference between the No. 3 heater nd the one first described is that there s a water cylinder around the fire grate vhich heats water stored in a galvanized ron reserve tank.

The radiators furnished with these sys-ems are of the best cast iron sectional ariety. They are freely circulating, and re tested to eighty pounds water pressure efore leaving the factory.

DEALERS MAY USE TRAFFIC DEPARTMENT

The National Association of Automobile Manufacturers, Inc., in order to give deal-rs throughout the country the fullest enefit of its work, has notified dealers hat if they will communicate with the raffic department, 7 East Forty-second treet, New York, they will be given full nformation on any matters pertaining to hipments of automobiles. This will in-lude advice as to correct freight rates, nd the collection without charge of laims against railroads for overcharge in reight, or for loss and damage. The Ex-ecutive Committee of the National Asso-

troit baseball club, is going into the automobile business, in Atlanta, Ga. He will handle the Hupmobile.

A new building, 61x147 feet in size, is being erected at East 65th street and Euclid avenue, Cleveland, O., and when finished will be occupied by the Rambler Automobile Co., who will use it as a garage and salesroom.

A Studebaker garage and salesroom was recently opened at Fourth and Chestnut streets, Columbus, O., by the Studebaker Automobile Sales Co., of which A. J. Pray is the manager.

L. J. Wells is erecting a seven-story fireproof garage, having a salesroom on the first floor at Ninth and Mulberry streets, Des Moines, Ia. The new building will house the local agency for the Moon cars.

The Spoonheim-Riddell Motor Sales Co. was recently incorporated with $10,000 capital to do business in Hatton, N. D., where the new concern is agent for the Halladay and Empire cars.

C. C. Slaughter, of Los Angeles, Cal., is now occupying his new quarters at 1026 S. Olive street where he is handling the Stearns cars exclusively.

L. M. Cregor and E. R. Howard have opened a garage at 135 Third avenue, Nashville, Tenn., where they have located the agencies for the Chalmers-Detroit and Hudson cars.

E. E. Houk, Nashville, Tenn., agent for the Hupmobile and White cars, is erecting a modern fireproof garage two stories high, having floor space for 100 cars.

The Federal Motor Car Company recently opened offices at 5922 Baum street, Pittsburg, Pa., where an agency for the Oldsmobile and Oakland cars is being conducted. The new concern has also opened a 5-story garage and repair shop at 5414 Henry street.

GARAGE NOTES.

The Corker Co. is erecting a four-story 50x100 brick garage at James and Fairlie streets, Atlanta, Ga.

A. M. Eastwich is erecting a $12,000 garage at Maryland avenue and Charles street, Baltimore, Md. The new building is to be 40 by 100 feet.

Z. A. Robertson, of Gaffney, S. C., has erected and opened for business a two-story brick garage on Robertson street.

A garage has been opened in Geneva, N. Y., by Baker Brothers, in the old King livery stable on Castle street.

C. W. Gray is erecting a one-story garage on State street, Watertown, N. Y. The new building will have a capacity of 100 cars.

H. N. Magoun has built a garage at Hanover, Mass., and is conducting a storage and repair business.

A 75x100 foot $18,250 two-story garage is being erected for Robert Segelken on Hudson boulevard, between Stagg and Spruce streets, Hudson City, N. J.

W. T. Dill is erecting a 48x150 foot one-story garage on Crown street, New Haven, Conn.

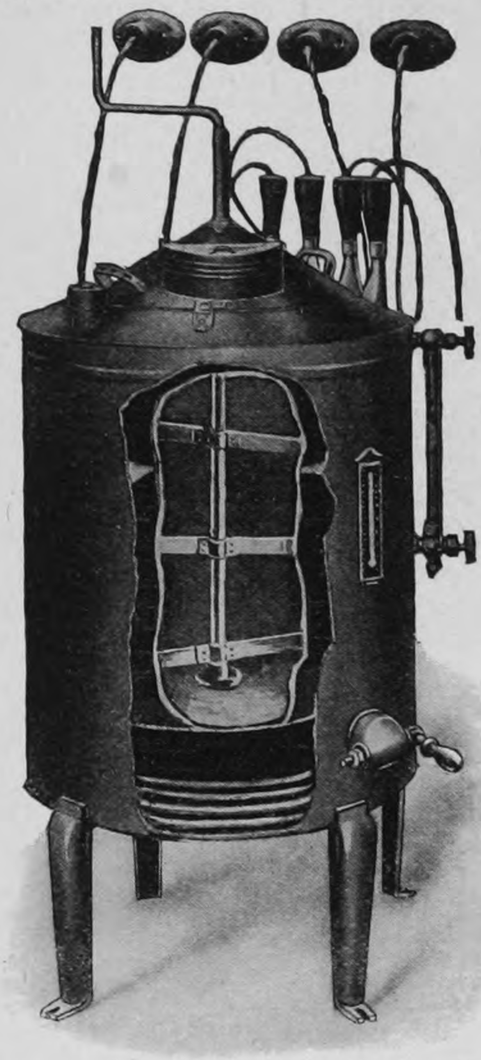
The Omaha (Neb.) Buick Automobile Agency is erecting a one-story brick garage on Farnam street between Nineteenth and Twentieth.

H. P. Bouser has opened a large repair shop at 7001 Kelly street, Pittsburg, Pa., which he conducts under the name of the Belmar Automobile Repair Co.

The Reading Automobile Company is erecting a two-story fireproof brick garage on North Fifth street, between Washington and Walnut streets.

A $40,000 garage is being erected on State street, Salt Lake City, Utah, for James and Oscar Moyle. The new building will be two stories high, the first of which will be 76¼x247 ledo, Ohio, manufacture all sizes and styles of glue heaters and other glue room appliances for use in connection with various heating agents, such as gas, gasoline, kerosene, steam and electricity.

Two of the heaters are illustrated herewith the "Wetmore" Model A and "Wetmore" Model R-1, both of which are adapted for the use of electricity.



"Model A Wetmore" patent glue heater as fitted for electricity.

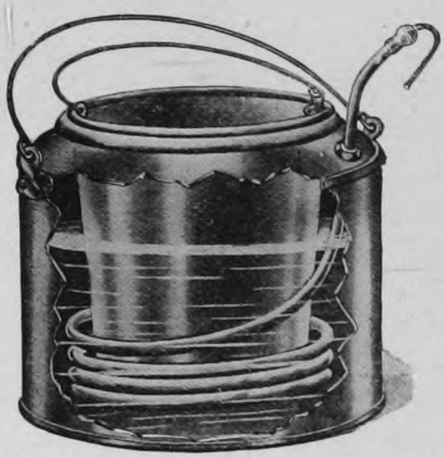
The Model A heater consists of an airtight melting chamber surrounded by a water chamber or jacket, and a mineral wool receptacle; the whole being made of heavy sheet copper, weighing 20 to 40 ounces to the square foot, according to size and capacity.

When equipped with heat retaining jacket, the cost of operation is not excessive, when convenience and accuracy are considered. The heat retaining jacket is lined with mineral wool, one of the best known non-conducting substances, and which greatly reduces the cost for current. By turning on the current for one hour in the morning, the glue is brought to a proper temperature, after which the cur-

the balance of the day. The electric co of this glue heater are supplied with thre currents, minimum, medium and maximum, so that complete control of the hea can be had at all times.

In the illustration the coil is shown i the bottom of the heater. The "Advance thermometer and the self-cleaning wate gauge shown are fitted at extra cost.

In the center of the melting chamber is shown the solid brass agitato Attention is called to the peculiar construction of the arms or paddles, whic are so designed as to cut and thoroughl macerate and agitate the mass, aiding th heat and water in quickly reducing it t the proper consistency. All the "Wetmore models are regularly fitted with the Advance special Bull Dog glue faucet or gat It is made of solid brass, non-corroding will wear as long as the heater, and allows the tank to be emptied entirely, a its bottom wall is below the level of th bottom of the tank.



"Model R-I Wetmore" patent glue heater as fitted f use with electricity.

The Model R-1 is this concern's simple form of electrically heated portable comb nation heater and warmer, consisting of single pot, holding one, two or four pint with single jacket. Its portability make it very convenient, as it can be attache anywhere, being fitted with coil and co necting plug as shown. All of the portab warmers are very substantially made, on extra heavy copper being used throughou with brass eyelets on the pots.

Following the most successful season its history, the Moline Automobile C East Moline, Ill., is building an addition factory, 100x125 feet and four stories hig When finished this will give the Moli Company, 50,000 square feet addition floor space which will be used for chass and body assembling and storage. Th good showing made in the recent Glidde tour has caused a demand for the agen

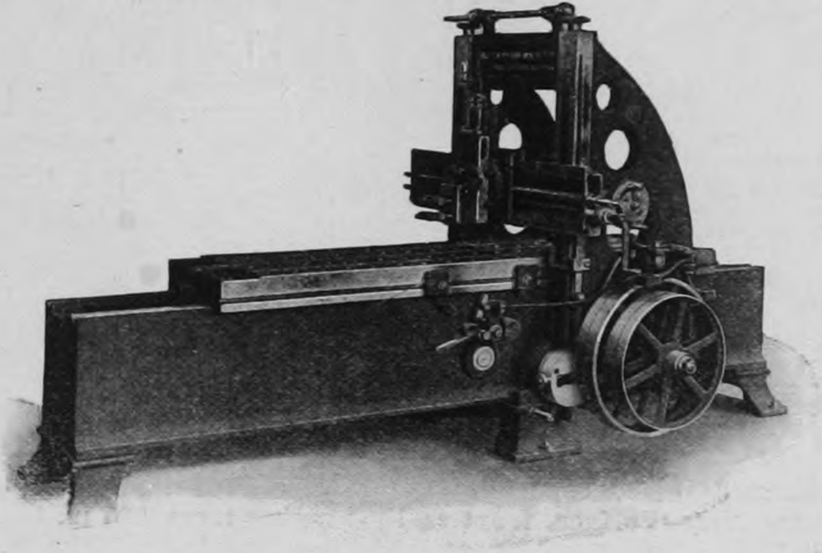
THE "ROCKFORD" METAL PLANER

The accompanying cut illustrates the 4 in. x 24 in. "Rockford" metal planer nanufactured by the Rockford Machine Tool Company, of Rockford, Ill.

The bed is of heavy deep pattern, 10 eet long and 17½ in. deep. It is thorughly braced by box form cross girders, nd is 12 ins. wide between V's which are ccurately scraped to a perfect bearing heir entire length and fitted with automatic roller oiling device, which insures erfect lubrication. The table is 6 feet x 1 ins. x 4½ ins. and is heavy and proper- proportioned. T slots are cut 5 ins. part from the solid, and holes are drilled nd reamed. It is fitted with a dirt proof eature, which prevents chips from falling nto the V's.

The housings are of the cored box form, nd are securely bolted and pinned to the de, extending down the full depth of the ed, which is the strongest possible conruction. The bearings for the rail are ide and scraped to surface plates. The rossrail is box section, with wide beargs, and is carefully fitted to the housgs. It is arch-shape on the back making very rigid. The head is strongly secured the saddle by four bolts. It has an unsually long down feed of 9½ inches and conveniently adjusted to any angle, as e saddle is graduated in degrees around e entire circle. It has automatic cross, ertical and angular feeds, and a quick rern. The down feed is provided with icrometer adjustment graduated in thoundths.

The bearings for the driving shafts const of large solid bushings accurately



24-inch by 24-inch "Rockford" Metal Planer.

possible rigidity, entirely removing their menace to the operator, and they are perfectly protected from injury and falling chips. The feed rack and all pinions are made of bar steel. All racks and gears are cut from the solid. The bull gear is fixed to its shaft, which runs in long bushed bearings. The shafts are made of crucible steel accurately finished by grinding. The shifting device is very simple and reverses the table without shock or jar, and has locking device which prevents the table from starting except at the will of the operator. The countershaft bearings are ring oiling.

This planer has a cutting speed of 30 feet and a return speed of 90 feet. The total height is 72 inches, total width 60 inches and total working length, 15 feet. The bed is furnished in any even length.

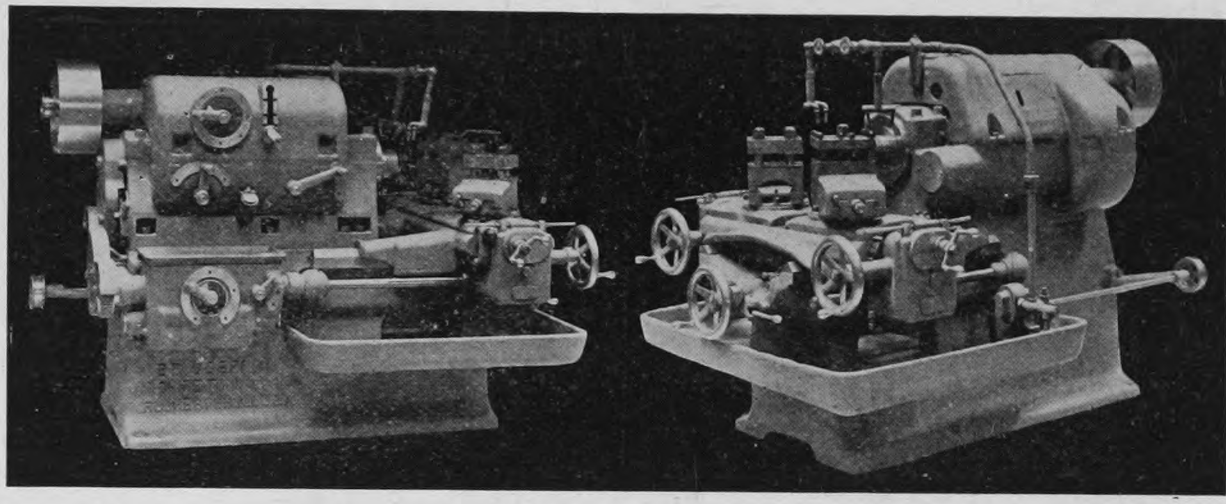
THE ONLY BAND SAW FILING AND SETTING MACHINE

The Black Diamond Saw and Machine Works, of 3-5 Palmer avenue, Natick, Mass., are manufacturing the Band Saw Filing and Setting Machine

This machine is a necessity in an automobile factory's pattern shop or in the body building department and, in fact, any place where band saws are used. With this machine the saw is filed in a vertical position, hanging from a peg overhead. In this manner the machine occupies less than one-fourth the bench space than would otherwise be required. The saw is held by friction and a spring device is fitted which allows for unevenness in the thickness of the saw. This

The accompanying photos illustrate the latest product placed on the market by the Bridgeford Machine Tool Works, 225-29 Mill street, Rochester, N. Y., the same being a new lathe for turning up bevel gears.

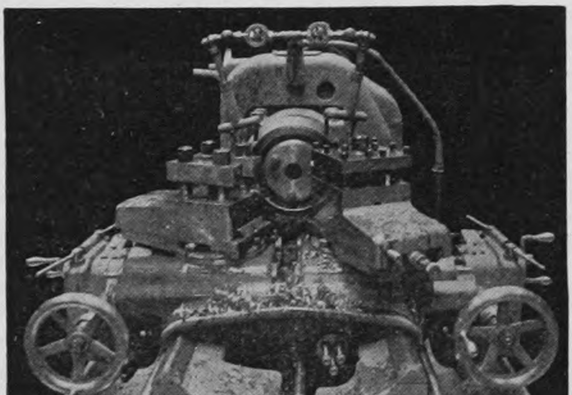
angle turning rests, the right hand o having a turret tool holder. The carriag cross slides and angle rests have pow feed and automatic stops, and hand whee are arranged as shown, within easy rea of the operator for operating the ang rests.



Two views of the "Bridgeford" Bevel Gear Turning Lathe.

This machine is designed especially for turning simultaneously the face, front and back angles of bevel pinions and gears up to 18 inches in diameter, although the first operation consisting of boring and facing the back may also be handled advantageously. The headstock used on this machine is of similar design to those used on this concern's heavy duty geared head engine lathes. The frame, oil pan and reservoir are in one piece.

The drive is through a constant speed pulley, 15 in. diameter for 6 in. belt, running 440 R. P. M. and there are twelve spindle speeds ranging from 5.8 to 214 R. P. M. This gives sufficient pulling power to enable three cutting tools to be used up to the limit. All gears within the head are steel and run in oil and the bearings are self-oiling.



The feed box gives ten ratios of fee ranging from .005 in. to .190 in. per revolu tion of spindle. The gears are steel an run in oil.

For the first operation the blank chucked in a universal chuck, bored wit a tool in the left hand rest, while the fa ing is done by tools held in the turret the right hand rest.

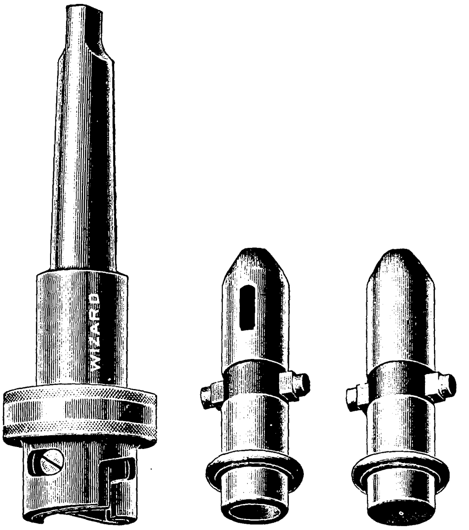
For the second operation the blank either chucked on a special hub or an a bor, in the taper spindle hole, having split bushing, the left hand turret rest ca rying a roughing and a finishing tool fo the face angle and the turret of the righ hand rest a set of roughing and finishin tools for the front and back angles. Th total weight of the machine is 7,300 pound net.

THE "WIZARD" QUICK CHANGE DRILL CHUCK AND COLLETS

This tool is manufactured by the Mc Croskey-Reamer Co., Inc., of Meadvill Penna., and marketed by William Nicholls, 253-5 Broadway, New York Cit

The Wizard Chuck and Collets are de signed for the changing of various size and kinds of tools in rapid successio without stopping the drill press. handles almost any range of tools an practically converts a one spindle machin into a multiple spindle or turret machin The operation of the chuck is instantan ing amount of "play" about the end of the tool. This makes it possible to use the chuck in accurate work. In the case of taps, if a "float" is desired, it can be secured in fitting the tap in the collet. The same is true in the case of reamers. Thus a tool can be held either rigid or floated as desired. In either case, it is perfectly centered.

Other features of the Wizard are that it manipulates more easily at high speed, has a more powerful drive, and also the fact that it is hardened and ground all over, inside and out.

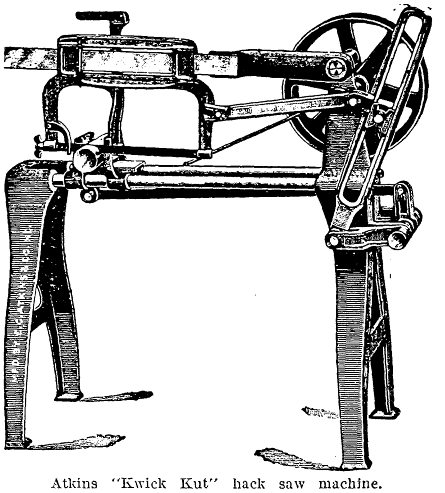


The "Wizard" Chuck, "Wizard" Collet and Blank Collet. The Wizard collet is designed for Morse Taper Shanks while the blank collet can be fitted for straight or special shanks.

Wizard collets are regularly fitted for Morse Taper Shank Tools, but can easily be fitted for straight or special shanks if desired. They are drop forged from best steel, machined, hardened and ground. The upper end has a cone shaped taper, which fits into a corresponding taper seat at the upper end of chuck bore and not only centers the tool perfectly and helps to hold it rigid, but makes it easier to get the collet started into the chuck when the machine is running at high speed. The "cam" slot in the locking collar draws the collet up against this taper, thus taking away all lost motion and holding the tool rigid and centered. The Wizard collets are also provided with a ring or flange, which serves as a shoulder against the hand in inserting the collet and in catching it when released, and also helps to keep the bearing surface of the collet from getting burred up. The whole collet including drive lugs and ring is one solid piece of steel. This chuck can be driven backward as well as forward and holds the tool so powerfully that it can also be used for back-facing, if desired. The chucks are machined from best steel, hardened and ground inside and out. The blank collets are not hardened and may easily be bored to receive the straight shanks of drills, taps, reamers, etc. The blank collets are sent 5-1000 over size so that they may be hardened and ground after being fitted to the shank. The operation of the Wizard chuck is instantaneous and exceedingly simple. A slight resistance to the outside collar with the hand while the spindle is in motion overcomes the tension of the spiral spring within and throws the key slot in the chuck open so that the collet will either fall out or slip into the slot. The spring then throws the collar back to closed position, closing the key slot and securely locking the collet in place. Thus a touch to the collar releases one tool and another tool is inserted with another touch. The motion of the spindle itself does the work.

ATKINS "KWIK KUT" HACK SAW MACHINE

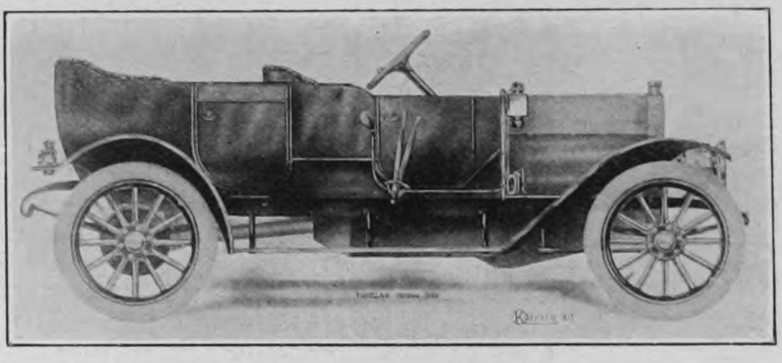
The "Kwik Kut" hack saw machine illustrated herewith is manufactured by E. C. Atkins & Co., Inc., Indianapolis, Ind. This machine is built on strong mechanical lines with all wearing parts large and durable. It is so constructed that the whole saw blade is used in cutting and it automatically adjusts itself to all sizes of cuts. It is called "Kwik Kut" because of the rapid return of the saw arm. The blade has a regular forward motion but has a return three times as fast thus saving the time consumed by machines which move forward and backward at the same speed. It has an automatic attachment which throws out the clutch and stops the machine as soon as the complete cut is made.



Atkins "Kwick Kut" hack saw machine.

The frame is so designed that it may be thrown back if desired leaving the vise clear. The vise is equipped with a right and left hand screw. The saw frame is mounted on a flat guide assuring straight cuts thus avoiding the breakage of blades.

KOEHLER "40"



AT $1650.00

represents the greatest value thus far presented in the automobile business, and we think we are justified in stating that no automobile introduced this season has created such a sensation. The **"Koehler 40"** is a car developed as the result of 12 years' experience in selling automobiles, and in design, material and workmanship it is equal to cars selling for $3000 and more. The type of body known as the "Montclair" is one of the most exclusive and luxurious styles introduced for 1910. High quality and low price are combined in the **"Koehler 40,"** and it is therefore a car for the man who wants the best and full value.

DEALERS:—

We can give you the most complete and best selling line in the United States for 1910. It includes the

HUPMOBILE	**—4 cyl., 20 H. P., Runabout,**	**$ 750**
RIDER-LEWIS	**—4 cyl., 30 H. P., Touring Car,**	**$1050**
RIDER-LEWIS	**—6 cyl., 7-Passenger " "**	**$2500**
KOEHLER "40"	**—4 cyl., 5-Passenger " "**	**$1650**

We are general distributors for these cars in the following territory.

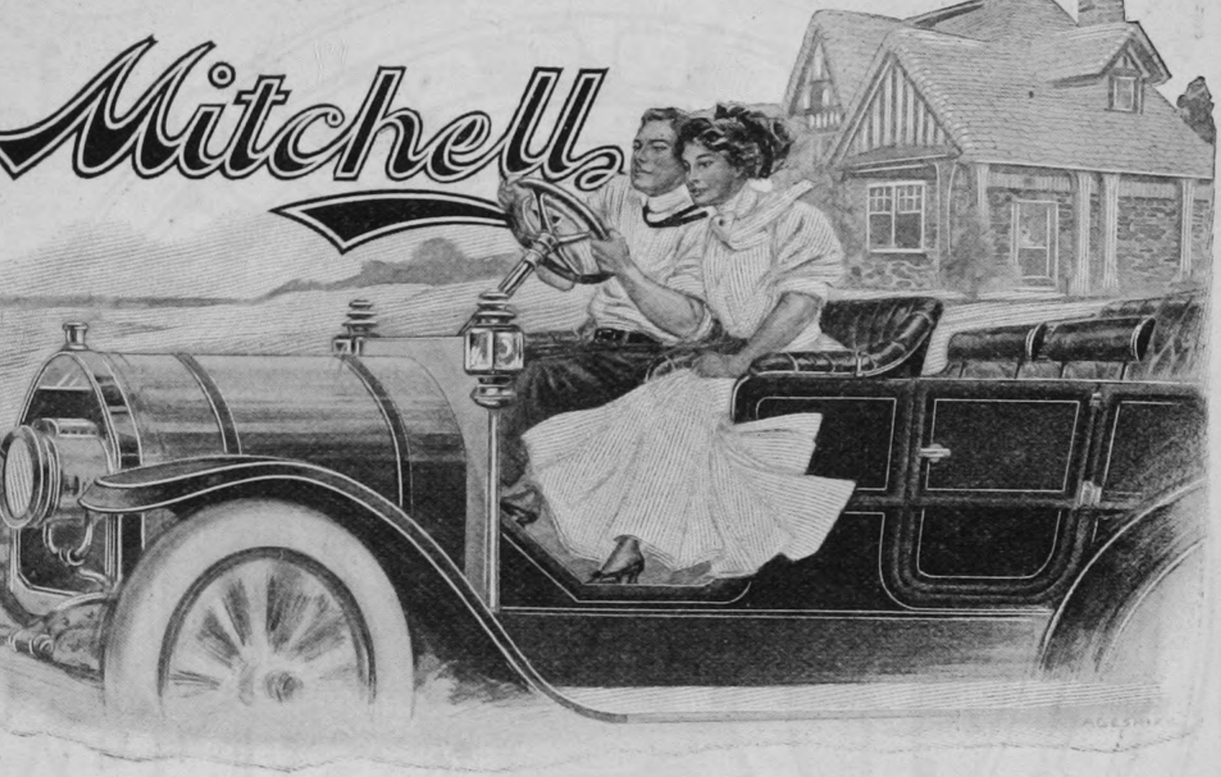
Koehler "40"—United States.

Rider-Lewis —New York, New Jersey, Pennsylvania, Delaware, Connecticut, Rhode Island, New Hampshire, Vermont, Massachusetts.

Hupmobile —New York, east of and including Rochester, North Eastern and Central Pennsylvania, Maine, New Hampshire, Vermont, Massachusetts and Connecticut.

Write us now for agency proposition.

H. J. KOEHLER CO.



The Mitchell Model "S"

SIX-CYLINDER—FIFTY HORSE-POWER—130 INCH WHEEL BASE

A KING'S CAR AT YOUR PRICE

Possessing all the quality of the high-priced cars, yet sold closer to its actual value than any other ig car in the world.

A car which shows what can be done when the desire exists—and when a car is built to the ninutest detail in one's own factory, where values can be estimated to a hair.

We have just completed the finest automobile works in America and the first effect of our increased acilities is better cars for the same money in two instances and a better car for less money in another.

The Mitchell Six is a direct development of the Mitchell Four of 1909. We have added two ylinders—increased the horse-power from 40 to 50—lengthened the wheel base to 130 inches—put on new nd better springs—improved the beauty of lines and finish—and all without adding a penny to the price f the 1909 car—$2,000.

This is as classy and aristocratic a car as there is in America and it mustn't be embraced in the "cheap car" class, for it contains precisely the same materials as are used in the highest priced cars and s **cheap** only in price.

It will be the buy in 1910.

SPECIFICATIONS:

IOTOR:	4¼x5 inches.	TOOL BOXES:	Steel baked enamel.
RANSMISSION:	Selective type.	SEATING CAPACITY:	Seven Passengers.
VHEELS:	36x4 inches.	STEERING WHEEL:	Natural finish.
VHEEL BASE:	130 inches.	SPRINGS:	Platform type.
GNITION:	Magneto and dry Cells.	BODY OPTIONS:	Seven passenger touring or close coupled body.
OLOR:	Dark blue, cream running gear. Option: Dark maroon, cream running gear.	EQUIPMENT:	Oil lamps and horn, full tool equipment, including a jack.

PRICE, $2,000—F. O. B. RACINE

Mitchell Motor Car Co.
Racine Wis. U. S. A.

HESS
BRIGHT
BEARINGS

PUNCTUALITY in SUPPLY

of the materials that the automobile builder buys is so vital a factor that its failure will defeat the most perfect car building and selling organization.

HESS-BRIGHT is SYNONYMOUS with PUNCTUALITY

It is true that HESS-BRIGHT BALL BEARINGS are not the lowest priced—the best article in its line never is—but what becomes of the purchasing department's laudable economy of a few dollars per car when that car is held up?

ENSURE CAR OUTPUT ON TIME by RELIANCE ON HESS-BRIGHT

Verify this by inquiry of our customers—they are not difficult to find—then send us your specifications.

THE HESS-BRIGHT MFG. CO., 2102 FAIRMOUNT AVE., PHILADELPHIA, PENNA.
NEW YORK BRANCH STORE :: :: :: 1974 BROADWAY

TRADE CHANGES

The Albany Garage Company, Albany, N. Y., is erecting an addition to its building on Howard street, which will extend to William street and be four stories and cellar in height. This addition, together with the present building, will give a floor area of about 37,000 square feet.

The firm of Gery and Wink, proprietors of the Berwin Auto Co., North Eighth street, Allentown, Pa., has been dissolved. Mr. Gery has bought out Mr. Wink's interest in the firm and is conducting the business the same as heretofore.

The garage business of L. A. Newman, in Auburn, Neb., was recently purchased by George Codington and Harry Furlong, who have placed it under the management of Albert Hutton.

The Bartholomew Automobile Company, makers of the Glide cars, recently moved their factory from West Bluff, Ill., to Peoria Heights.

The withdrawal of Mr. Westover from the firm of Westover and Fulton, of Beatrice, Neb., has caused the dissolution of that partnership. The business is now being conducted by Mr. Fulton under the name of the Fulton Auto Repair Co.

The name of the Rantz Motor Sales Company, of Bridgeport, Conn., was recently changed to the Erwin Jennings Company.

The Buick Motor Company is building two additions to its factory at Flint, Mich. One is to be 150x55 feet, three stories high, and the other 21x112 feet, one story high.

F. E. Avery recently completed a two-story fireproof brick addition to his garage on Franklin avenue, Columbus, O.

The Wentworth automobile garage at 264 Central avenue, Dover, N. H., was recently sold to Harry Grover who is now conducting the business, which includes the local agency for the Overland.

The capital stock of the Harley-Davidson Motor Company, Milwaukee, Wis., was recently increased from $35,000 to $100,000.

FIRES, JUDGMENTS AND FAILURES

The Meteor Automobile factory, located at Bettendorf, Ia., was recently totally destroyed by a fire of unknown origin, entailing a loss of $50,000.

N. O. Tyler's garage at 2125 First avenue, Birmingham, Ala., was recently badly damaged by a fire which destroyed twelve automobiles.

A $10,000 fire recently damaged the garage of Wright Howard at 147 Washington avenue, Boston, Mass.

Five automobiles were totally destroyed and twenty others badly damaged by a fire recently at the Montauk Garage, 906 Union street, Brooklyn, N. Y. The loss is estimated at about $50,000.

Fire recently damaged the property of the G. W. Brown Motor Co., Milwaukee, Wis., to the extent of $2,500, and destroyed five automobiles stored on the premises.

Owing to the prompt action of employees in removing the cars, a recent fire in the garage of the West End Motor and Taxicab Company, 246 W. Sixty-fifth street, New York, resulted in damage to only one machine with the estimated loss of about $500

The bankrupt Twentieth Century Mfg. Co., New York City, has made a settlement with its creditors at 25 cents on the dollar in cash, Judge Adams confirming the composition. The concern had liabilities of $63,201, and assets of $23,837.

Recently a short circuit in the mechanism of an automobile under repair at the garage of the Federal Motorcar Co., 4514-4518 Henry street, Pittsburg, Pa., was followed by an explosion of gasoline. Two men were injured and the fire resulted in damage amounting to $6,400.

A recent fire of unknown origin threatened for a time to destroy the garage of the Automobile Exchange and Supply Company, 18 Sabin street, Providence, R. I. It was finally put out, however, and caused only a slight loss.

W. H. Heinzerlinger's brick garage on Broadway, between Union and Pike streets, Seattle, Wash., was destroyed by fire recently, together with twenty automobiles stored in the place.

NEW AGENCIES.

Memphis, Tenn., J. H. Parphery, Moon.

Milwaukee, Wis., Wordingham Auto Supply Co., Moline.

St. Louis, Mo., Petroe-Phillips Automobile Co., Parry.

Philadelphia, Pa., Longstreth Motor Car Company, Pullman.

Hazleton, Pa., Henry Dryfoos, Jr., Speedwell.

Kramer, Ind., Joseph Rice, Great Western.

Fort Wayne, Ind., Brosius-Sesline Co., Reo.

Brooklyn, N. Y., Kenny Motor Co., Rambler.

Holyrood, Kan., J. L. Baker, Moon.

St. Louis, Mo., H. F. Van Cleave, Speedwell.

Columbus, O., Studebaker Auto Sales Co., Studebaker.

Minneapolis, Minn., Northland Motor Car Company, Stoddard-Dayton.

San Francisco, Cal., Cuyler Lee, Packard.

Los Angeles, Cal., Stearns Automobile Co., Moon.

Adrian, Minn., Prideaux Brothers, Overland.

San Antonio, Tex., Geo. W. Grahm, Speedwell.

Hatton, N. D., Spoonheim-Riddell Motor Sales Co., Empire.

Edwardsville, Ill., D. J. Keller, Moon.

Fort Wayne, Ind., Brosius-Sesline Co., Maxwell.

San Antonio, Tex., A. E. Staack Automobile Co., Selden.

Atlanta, Ga., J. W. Goldsmith, Jr., Speedwell.

Des Moines, Ia., J. Wills, Moon.

Alexandria, Minn., Slade Brothers, Imperial.

Joplin, Mo., B. M. Robinson, Speedwell.

Denver, Col., Krebs-Covington Auto Co., Haynes and Detroit Electric.

St. George, N. Y., W. W. Cornell, Maxwell.

New Castle, Ind., Goodwin Motor Co., De Tamble.

Aurora, Neb., J. H. Donner, Moon.

Hartford, Conn., Brown, Thomson & Co., Lozier.

Rochester, N. Y., Hollis-Rand Company, Speedwell.

Atlanta, Ga., J. P. Mathews and R. L. Logan, Pennsylvania.

Los Angeles, Cal., Wilson & Buffington, Thomas.

Hatton, N. D., Spoonheim-Riddell Motor Sales Co., Halladay.

Burlington, Vt., Hill Storage and Implement Co., Moon.

New York City, N. Y., Cloud-Marts Company, Selden.

Portland, Ore., Thompson-Cuthbert Company, Speedwell.

Minneapolis, Minn., Jackson Motor Co., Jackson.

Brooklyn, N. Y., C. T. Silver, Overland.

Oklahoma City, Okla., W. C. Ballard & Co., Moon.

Indianapolis, Ind., Buick Motor Co., Oldsmobile.

Washington, D. C., Newbold Speedwell Co., Speedwell.

Nebraska City, Neb., R. Duff & Co., Moon.

San Francisco, Cal., Cuyler Lee, Cadillac.

Brooklyn, N. Y., Standard Auto and Sales Co., National, Empire and Oakland.

Washington, D. C., Motor Sales Co., Moon.

TRADE PRINTED MATTER

The American Tap & Die Company, of Greenfield, Mass., has recently issued a catalogue illustrating threading tools, such as taps, dies, tap wrenches, die stocks, screw plates, etc. These tools are put up specially according to A. L. A. M. specifications.

The K-W Ignition Company, Cleveland, Ohio, has issued bulletin No. 12 of K-W magnetos, coils and search-lights. Special attention is called to their new lighting magnetos which produce powerful electric search-lights in addition to ignition. The catalog is replete with information regarding the construction of K-W coils and numerous wiring diagrams are given.

The Hoyt Electrical Instrument Works, of Penacook, N. H., has just issued a neatly gotten up booklet descriptive of their volt-ammeters, voltmeters and ammeters for direct current.

The Standard Underground Cable Company, of Pittsburg, has issued a 230 page catalog giving price lists of insulated wires, electric cables and accessories. Numerous tables and other information make this book very valuable. It is sent out in leather and cloth covers.

"Sparks" is the name of a monthly motorcycle booklet published by the American Motor Company, of Brockton, Mass. The first issue made its appearance during July. This monthly will be used as a means of advertising the M. M. Motorcycle at the same time as a means of keeping the motorcycle world posted on anything that might be of interest.

As an echo of the New York to Seattle Race, the Firestone Tire & Rubber Co. is distributing booklets reproducing in facsimile form, telegrams received from the Acme and Ford drivers en route, showing the excellent service given by Firestone tires.

The Automobile Club of America has forwarded to its members and tourists of the Bureau of Tours the 1909 edition of the A. C. A. Tour Book, which contains this year over 400 routes, covering all the main touring lines throughout the United States and a vast amount of practical touring information, a digest of all state automobile laws, and a list of officially appointed and recommended hotels along the touring lines, restaurants, garages and repair shops, etc., throughout touring sections, with a list of ferry time-tables, a complete set of diagrammatic touring maps and other valuable information of interest to motorists. For the benefit of the motoring public, this book is being sold to the public at a price covering its nominal cost of compilation, or three dollars.

The Apple Electric Company, of Dayton, Ohio, has issued Bulletin No. 11, which explains the "Aplco" Electric Lighting System for Automobiles.

The Studebaker Automobile Company has just received from the press a 146 page route book, which gives many popular routes between the larger cities in the Central States. Several routes are given between South Bend, Chicago, Indianapolis, Grand Rapids, Detroit, Toledo, Cleveland, Ft. Wayne and many other cities. There is also much information valuable to tourists. Every cross road, railroad, bridge—in fact all detailed matter of this nature is mentioned throughout each route. Other valuable information, such as where gasoline can be secured; also information regarding hotel accommodations in all cities included in the various routes is given in this book. The route book is very clearly printed on paper of weather resisting qualities and bound in a flexible linen back cover. Anyone desiring a copy of this book will be furnished with the same upon request to the Route Department, Studebaker Automobile Co., South Bend, Ind.

White Route Book No. 8 has just been issued by the Touring Bureau of the White Company. The new book gives detailed road directions from New York to Richmond, Va., and from Atlanta, Ga., to Stanton, Va. The principal roads connecting with those in the new book have already been charted in previous issues of the White Route Book, so that the tourist is now offered a wide choice of routes in touring between north and south. Another valuable feature of Route Book No. 8, is that it gives the new route from New York to Philadelphia, by way of the Delaware River Bridge at Trenton. The new book may be obtained without charge, on application to any branch or agency of the White Company, or by sending ten cents in stamps to the Touring Bureau of the White Company, 1402 Broadway, New York.

The Westinghouse Electric & Manufacturing Company, Pittsburg, Pa., has issued a handsomely printed little booklet describing the applications of its line of small motors to office, store and shop services. The numerous illustrations scattered through the pages suggest many time and labor saving uses for these efficient little power devices; among these are the motor-driven adding machine, mailing machine, eraser, graphophone, envelope sealer, vacuum cleaner, buffing and polishing wheel, blower, sign-flasher, box-covering machine, hand drill, hack saw, coffee grinder, etc.—applications selected at random from the large number of uses where the electric motor provides the ideal power. The booklet, "Westinghouse Electric Motors for the Office, Store and Shop," will be sent on request.

A motor club has been formed in Altoona, Pa., and the following officers elected: W. L. Hicks, Esq., president; E. J. Lomnitz, secretary, and W. W. Blake, treasurer.

The Utah Automobile Club is co-operating with boards of trade and commercial clubs in Utah and Idaho to secure the improvement of bad stretches of road between Salt Lake City and the Yellowstone National Park.

The officers of the newly formed Corning (N. Y.) Automobile Club are: President, Alanson B. Houghton; vice-president, John L. Lewis; secretary, Andrew B. Maltby; treasurer, Joseph C. Moore; executive committee, Frank D. Kingsbury, General Austin Lathrop and Colonel Henry G. Tuthill.

The Miami County Automobile Club has been organized at Peru, Ind., with E. Mack Morris as president; Milton Kraus, vice-president; Wm. E. Carson, secretary, and A. H. Kalbfleish as treasurer. The new club is going to devote particular attention to the promotion of good roads and the enforcement of the State laws.

The Chico Automobile Club has been organized at Chico, Cal., with a charter membership of forty-seven. The following were elected officers. President, Dr. C. L. Browning; vice-president, A. S. Jones; corresponding secretary, John Briscoe; financial secretary, S. B. Nourse; directors, P. J. Edwards, J. D. March, Dr. P. L. Hamilton, C. H. Hintz and G. C. Allen.

A club has been formed at Pottsville, Pa., called the Pottsville Automobile Club. The following officers were elected: President, Judge H. O. Bechtel; vice-president, W. A. Cather; secretary, J. H. Filbert; financial secretary, Captain Baird Halberstadt; treasurer, W. L. Kramer. R. J. Mills and R. H. Bergeman will, with the elected officers, form the board of governors.

THE NEW
SEARCHLIGHT GAS TANK
STRONG AND UNIFORM LIGHT

SEARCHLIGHT GAS
MAKES SUNLIGHT AT NIGHT

GUARANTEED 26% MORE
HOUR "ACETYLENE LIGHTING"
THAN ANY OTHER.

SIZE OF TANK 22" LONG. 6" DIAMETER
STANDARD CONNECTIONS, WILL FIT ANY CAR

MANUFACTURED UNDER
OWN PATENTED SYSTEM

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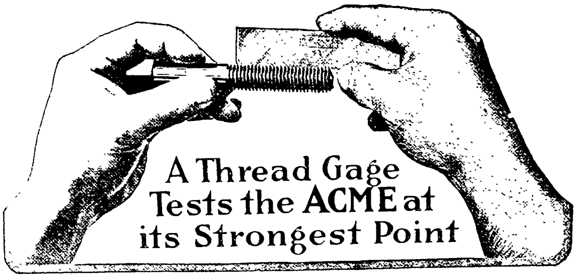
PITTSBURGH, PA. WARREN, OHIO.



IF you have Threading troubles, the ACME is the remedy. The Stationary Stock Spindle makes possible good Threads with ordinary and inexpensive Stock Threading Tools.

There is no crowding of the Die; it's not forced on, but rotated only, the feed depending upon the lead of the Thread. There is no drag in backing off.

Gages will show that the ACME Threads are right in shape and lead, that they are clean and smooth.

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EXPERIENCE
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"Exide" Duplex Sparking

Main 6-40, Emergency 6-5 List Price, $28.50
" 6-60, " 6-5 " " $33.50

"Exide" Sparking

6-40, List Price, $20.25 { 14 other sizes
6-60, " " $25.25 { from $7.75 to $46.75

These makers of gasolene cars use it as standard: Packard, Winton, Pierce-Arrow, Chalmers-Detroit, Columbia Motor Car Co., Locomobile, Acme, Pope, The Autocar, etc., etc.

Power—Speed—Hill-Climbing

Is your car giving you satisfactory service in these particulars? If not, equip it with

THE "Exide" SPARKING BATTERY

and you will be agreeably surprised at the result. The "Exide" gives you the hottest, fastest, "fattest" spark possible, which never fails to ignite the mixture. It will ignite poor mixtures inferior batteries could not.

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THE "Exide" SPARKING BATTERY

is the product of a Company that knows the battery business from A to Z. 21 years' experience takes concrete form in the "Exide." This experience is taken advantage of to produce a battery that will not leak, in which corrosion is banished and when you buy the "Exide" you know that you are getting the best.

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THE ELECTRIC STORAGE BATTERY CO. 1888 1909

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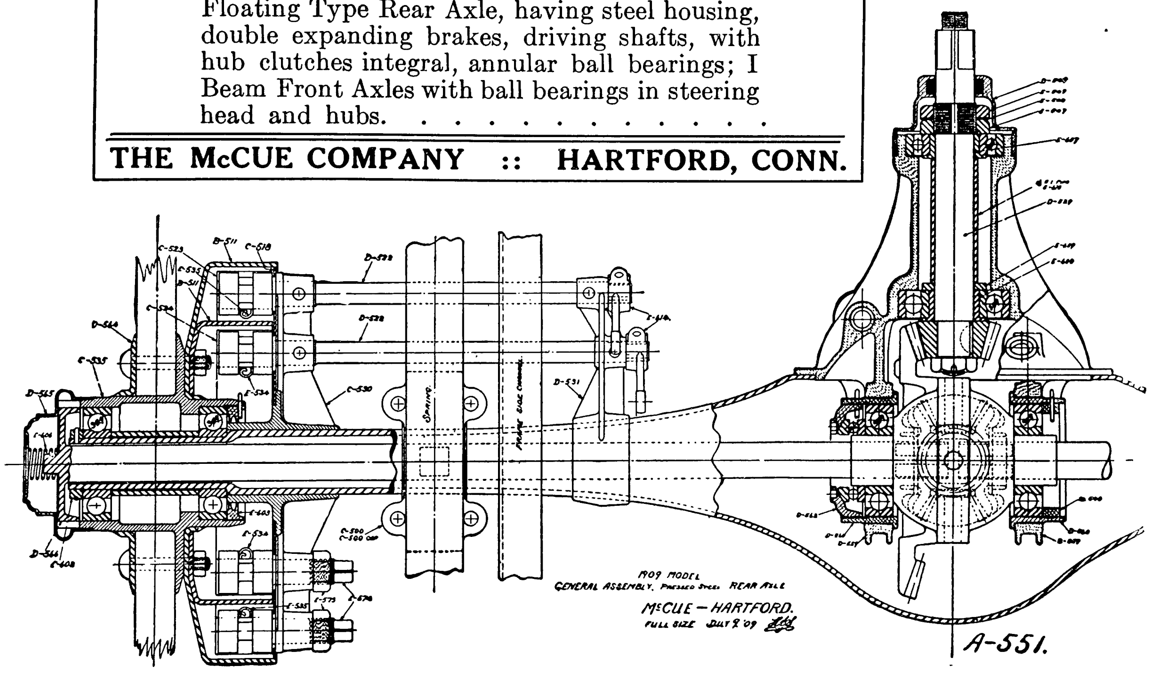
660 Distributors throughout the United States. Send for the name of the Distributor nearest you

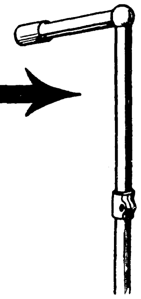
Automobile Axles

Floating Type Rear Axle, having steel housing, double expanding brakes, driving shafts, with hub clutches integral, annular ball bearings; I Beam Front Axles with ball bearings in steering head and hubs. . . . .

THE McCUE COMPANY :: HARTFORD, CONN.



Starting an Electric Vehicle is like turning on an Electric Light



PRESS THE LEVER AND GO

You can go farther, faster
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The "Exide" Battery

Over 90 per cent. of all Electrics manufactured are equipped with the "Exide." It's the one standard of the leaders in Electric Vehicle manufacturing.

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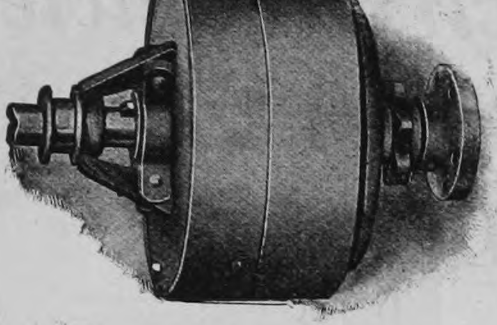
660 Distributors throughout the United States. Write for the name of the Distributor nearest you

See our "Exide" Sparking Battery advertisement at top of opposite page



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Manufactured Under
License from Patentee. (Ball Pat.)

Two Speeds Forward and Reverse

TWO SIZES
- 12 to 20 Horse Power for Light Touring Cars and Roadsters
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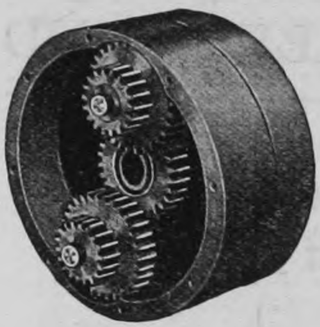
Send for Particulars and Prices in Quantities



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Gasoline Engines
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Rear Axles
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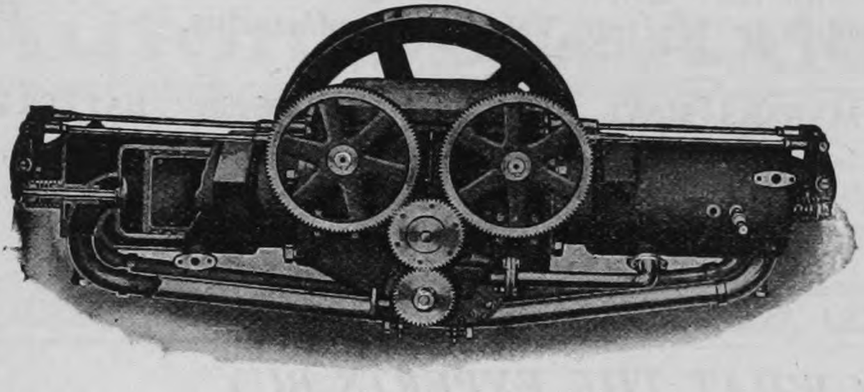
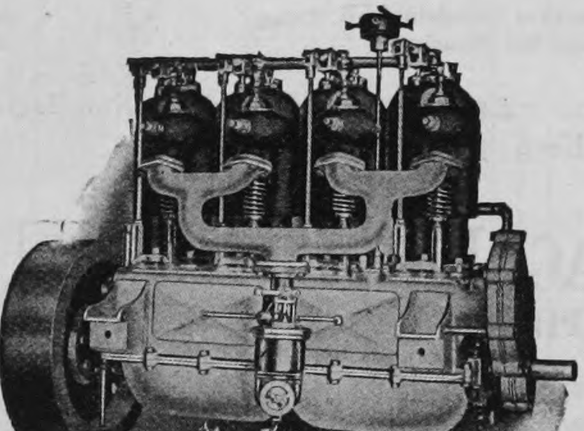
MICHIGAN AUTOMOBILE CO., Ltd., Kalamazoo, Michigan



If interested in the most powerful line of motors ever produced, considering weight where bearing surface and strength have not been sacrificed, write for circulars giving full description.



Double opposed motors built in two sizes, 5 x 5-18 H. P. and 5 x 7-24 H. P. Four cylinder motors in three sizes, 4 x 5-30 H. P., 4½ x 5½-40 H. P. and 5 x 5½-50 H. P.

MODEL GAS ENGINE WORKS
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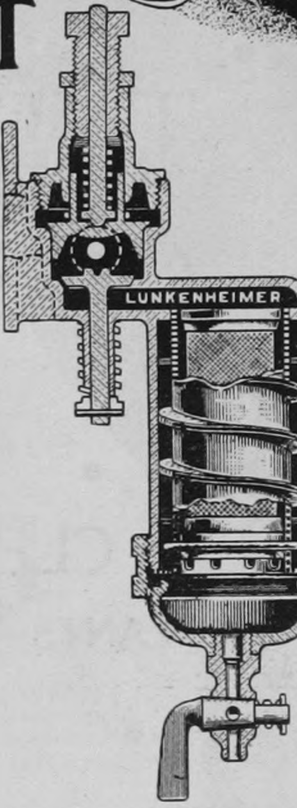
EXHAUST PRESSURE REGULATOR



For automobiles and motor boats to automatically control the pressure of exhaust gas for forcing the gasoline from the main to an auxiliary tank or direct to the carburetor, or for operating an exhaust pressure lubricator.

Undoubtedly, the most effective and practical device ever produced. Made in nine styles for convenience of connecting.

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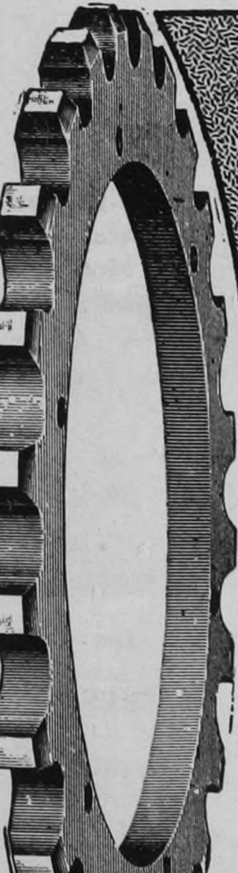

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For Diamond, Baldwin and Whitney Chains

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Sprockets in stock and to order

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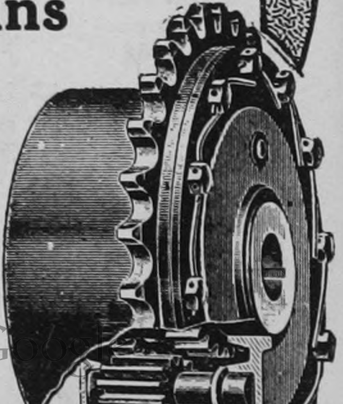

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GENERAL OFFICE
CLEVELAND, OHIO
PLANTS—Cleveland, Detroit, Buffalo, Syracuse
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High Grade Beaver Motors

Work Like Beavers—Silent, Sure, Satisfactory

6 Cylinder Vertical, 4⅜ x 4¾
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4 Cylinder Horizontal Opposed, 5⅛ x 4½

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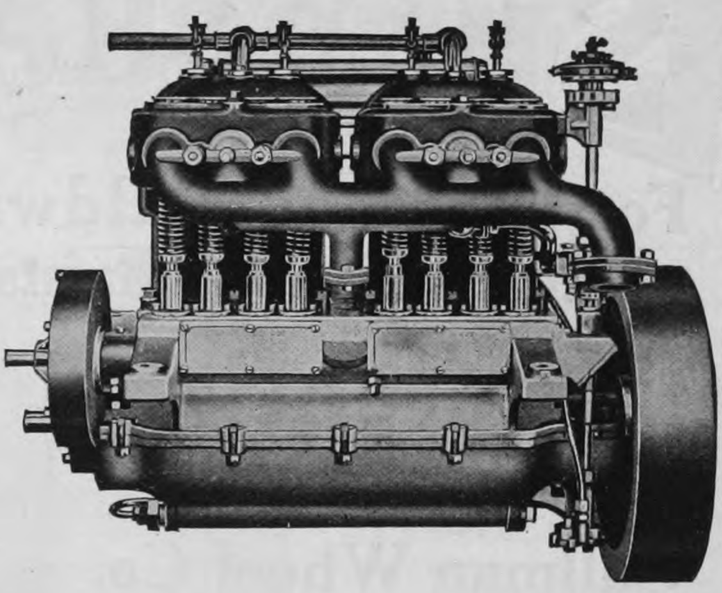
All Motors are Four Cycle



The 4 Cylinder Horizontal Opposed Motor is Designed Specially for Commercial Trucks.

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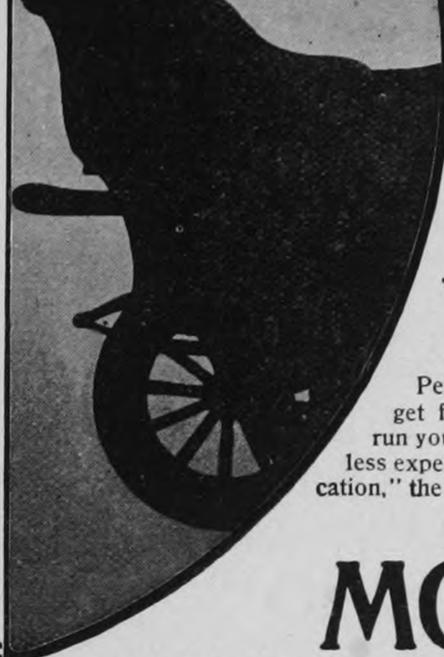

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is made in six different grades, one of which is made for your particular car. It saves you expense and experiment. It protects your car from friction, the hardest, costliest kind of motor wear.

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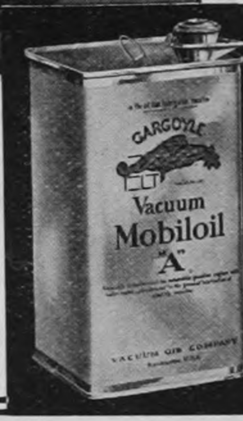

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They are built on the Ham Perfect "cold blast" principle, which insures a clear, steady, white light, that will not blow out in the strongest winds, or jar out on rough roads.

They are beautiful in design and finish. An ornament to any car, to give it the artistic finish.

We have a very attractive proposition to offer Manufacturers of, and Dealers in Runabouts and High Wheel Automobiles.

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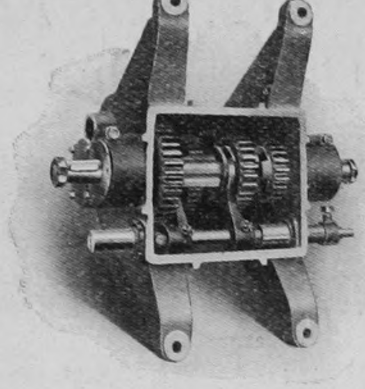

1910 TYPE E

TRANSMISSION

Selective
Three Speeds Ahead and One **Reverse**
Transmits 20 to 50 H. P.
Gears bolted to Flanges Integral with Shaft
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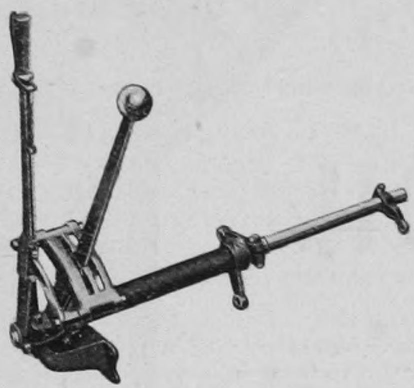

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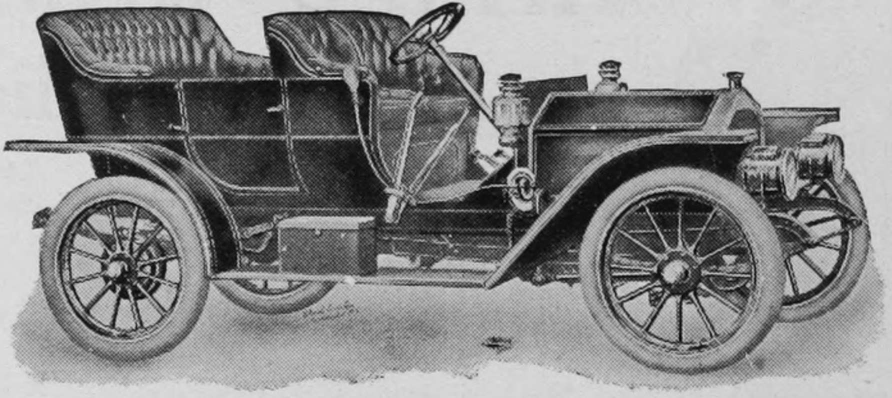
AUTOMOBILES

Model K Touring Car, 30 H. P.



Price $2,000

"Not only the best at the price; But the best at any price."

Model L, 20 H. P. Runabout,	$1500	Model 6-30, Light Speed Car,	$2500
" L, 20 " Toy Tonneau,	1600	" 4-40, Roadster,	3000
" K, 30 " " "	2000	" M, Touring Car,	3500
" K, 30 " Touring Car,	2000	" M, Toy Tonneau,	3500

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All New Goods, all High Grade Makes. Small Ad, Small Prices. Money Refunded at once if dissatisfied on receipt of goods. We are not going to tell you that we have contracts with Factories, for they are well able to sell their goods themselves. Our PRICES do the talking. Your money refunded, provided you do not use the goods. Before buying elsewhere let us give you expert information on tires. We are in the business 15 years. Even if you don't buy from us we will be glad to correspond with you. Will give you the best of our advice.

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30 x 2½	6.00	2.00
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36 x 3	10.00	2.00
30 x 3½	13.00	3.00
32 x 3½	14.00	3.50
34 x 3½	14.00	3.50
36 x 3½	12.00	3.00
30 x 4	16.50	3.50
32 x 4	17.00	3.75
34 x 4	19.00	4.00
36 x 4	17.00	3.50
32 x 4½	15.00	3.50
34 x 4½	19.00	4.00
36 x 4½	19.00	3.50
34 x 5	18.00	4.00
36 x 5	19.00	4.00

GOODYEAR, DUNLOP, MICHELIN TYPE

30 x 3½	$15.00
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Special Tires to fit 30 x 3 Clincher Rims, Brand New Shoe and Tube complete, $6.50 each.

Mail Orders Especially

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Largest Tire Dealers in U. S.

COSTLY EXPERIENCE TEACHES MOTORISTS TO USE

TRADE MARK REGISTERED IN UNITED STATES PATENT OFFICE
NON-FLUID OILS

for lubricating the transmissions and all the bearings of their cars.

It's only a matter of time when motorists are going to realize that *LUBRICATING* doesn't simply mean using the first grease or oil that happens to be handy, or cheap, or called just as good as NON-FLUID OILS.

Eventually *YOU* are going to learn that a car doesn't fall way off in working efficiency in one year because it's not made well. Motor car builders are not making that kind of cars. The material in the bearings is selected for its durability, but there is not a metal mined from the earth, or melted in a crucible, that will stand the rubbing and grinding and heating and hammering that motor car bearings undergo when they're lubricated like ox-cart axles.

It's so inconsistent to pay a thousand dollars, or two or three thousand, for a car and not *KNOW* that the bearings and gears—the very vitals of the mechanism—are insured against giving out. Think about it in that light—now—and act now. Clean out whatever grease or oil you're using and make your next run with everything tuned up and properly lubricated with NON-FLUID OIL.

The strange part of it is you spend more for your grease or oil, because you buy oftener. The repairs you're going to save will pay for your NON-FLUID OIL in any event.

You haven't had your car too long to make it worth while to get a supply of

"K-No. 000"

grade for bearings and differentials, and

"K-No. 00-Special"

grade for gear cases. Ask your dealer. Write us if he is not supplied. Don't take a substitute.

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165 BROADWAY, NEW YORK CITY
Sales Agents: United Manufacturers
BROADWAY and 76th St., NEW YORK CITY

The Houpt Car

4 cylinder, 60 horsepower, costing $5000, is now ready for delivery
6 cylinder, 90 horsepower, costing $6000, will be ready in October

The Houpt car represents five years' persistent experimentation and combines the experience of two decades in the development of motor cars. It is the highest expression of automobile engineering, the final word in motor car construction.

Harry S. Houpt Mfg. Co.

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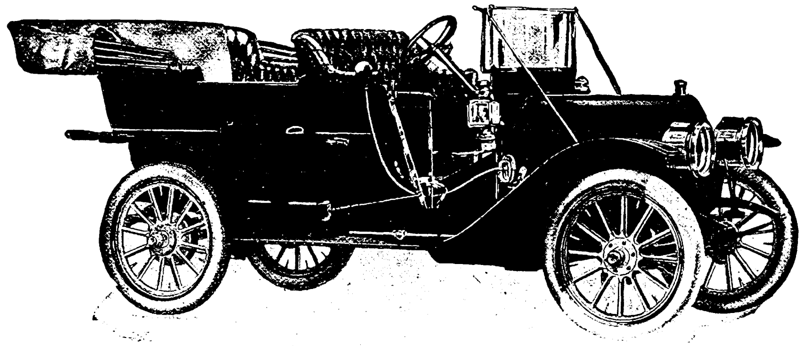
Now prepared to assign territorial rights throughout the United States

Dorris Model E, 1910

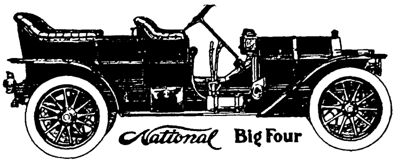


$2500, Fully Equipped with

Top and Dust Cover
Speedometer
Five Lamps
Tire Carrier
Prest-O-Lite Tank
Tools
All Brass Folding Wind Shield

DORRIS MOTOR CAR COMPANY, ST. LOUIS, MISSOURI

National



Costly Construction

The improvements on the National from year to year constitute a very good history of motor car development. It has generally been somewhat in advance, but its departures have always soon become standard practice with the best manufacturers.

In the introduction of the all-ball-bearing motor, however, only a few of the highest priced cars---all costing much more than the National---have followed it. It is expensive construction, but no expense is spared at any point to make the National the best.

Four Models--Fours and Sixes --from $2,750 to $5,000.

National Motor Vehicle Co.
1003 East 22nd St., Indianapolis, Ind.

How to Choose The Right Car

I

The Rear Axle

LOOK carefully at the *rear axle* of the car you are about to buy. Don't underrate *its* importance. If it breaks, the "hind-legs" of your machine are hopelessly out of commission. You are stalled for good and all. You can't even be towed—you come home ingloriously *on a truck.*

Who can say what the rear axle must endure? The power of the engine?—Yes, *that* can be figured. The shock of fast driving over rough roads?—Yes.

But who can compute with what force the wheels will fall into a rut of unknown depth, or how hard they will impact against an obstruction of unknown height and rigidity?—And all at an unknown velocity.

Plainly, the rear axle must be "above suspicion;" it must be stronger than any strain it can possibly encounter—harder than any jolt it may receive.

Note, therefore, these points about the rear-axle mechanism of

Glide

Cars for 1910

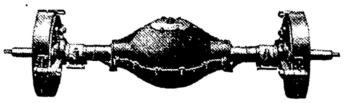
No weight-economy here. The needed weight is good. It gives traction to the wheels. And prevents the disastrous "figure-8's" that skidding entails.

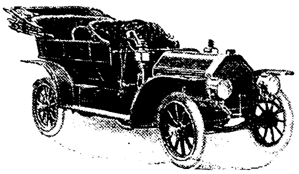
Here is the Glide rear axle. The metal is there. It looks strong; it is strong; and every ounce is stress-resisting metal. No dead weight.

Glide axles have no light keys or *pinned-together parts.* The most important parts are made integral—in one piece.

The simplest, most serviceable construction known to the mechanical art.

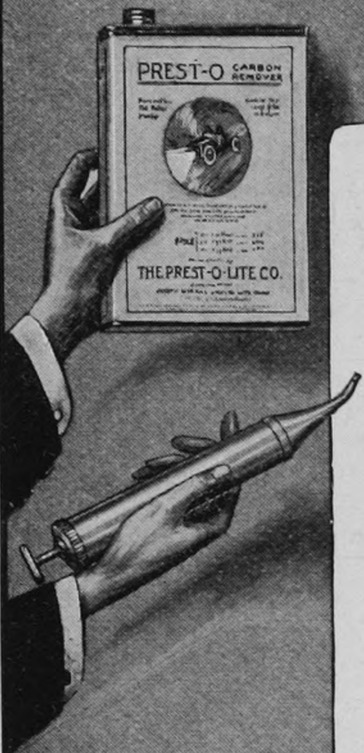
Let us send you full facts about the new Glide Cars for 1910. The greatest Automobile values of the year. Address as below.





The Bartholomew Company
210 Glide St.
Peoria, Ill., U.S.A.

Prest-O-Carbon Remover



Don't Tear Down Your Engine !

An engine torn to pieces and scraped is seldom as good as before.

Prest-O-Carbon Remover chemically dissolves and removes every particle of carbon from cylinders, pistons, piston rings and valves.

For Auto, Marine and Stationary Engines

Cannot injure the metal. Cleans one cylinder perfectly in an hour for 25 cents or less. Increases compression, power and durability. Does a better job than scraping. Simply apply with an oil gun.

We Will Refund Your Money if Prest-O-Carbon Remover doesn't do all we claim for it. Price: Gallon, $3.75: Half Gallon, $2; Quart, $1. Beware of imitations containing kerosene or strong acids. If your dealer does not supply you promptly, send your order to us, to be shipped from our nearest office.

The Prest-O-Lite Co. **237 East South Street**
INDIANAPOLIS, IND.

Makers of
Prest-O-Lite Tanks

Branches at New York, Boston, Philadelphia, San Francisco and Toronto

Mr. Dealer: "Good Goods" Always Pay Best

BLUE RIBBON

BLUE RIBBON
CREAM
METAL POLISH
FOR
CLEANING & POLISHING ALL METALS
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THE 20TH CENTURY AUTO POLISH

Outshines and Outlasts Them All

The Only Practical and Economical Polish Made for Garage Use, in 5 and 10 Gallon Cans—Does Not Settle

A THICK OIL CREAM POLISH

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Salle Ave.
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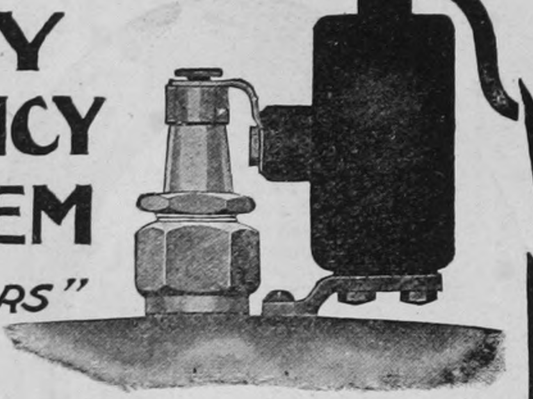
The SEELEY HIGH FREQUENCY IGNITION SYSTEM



"THE COIL WITHOUT VIBRATORS"

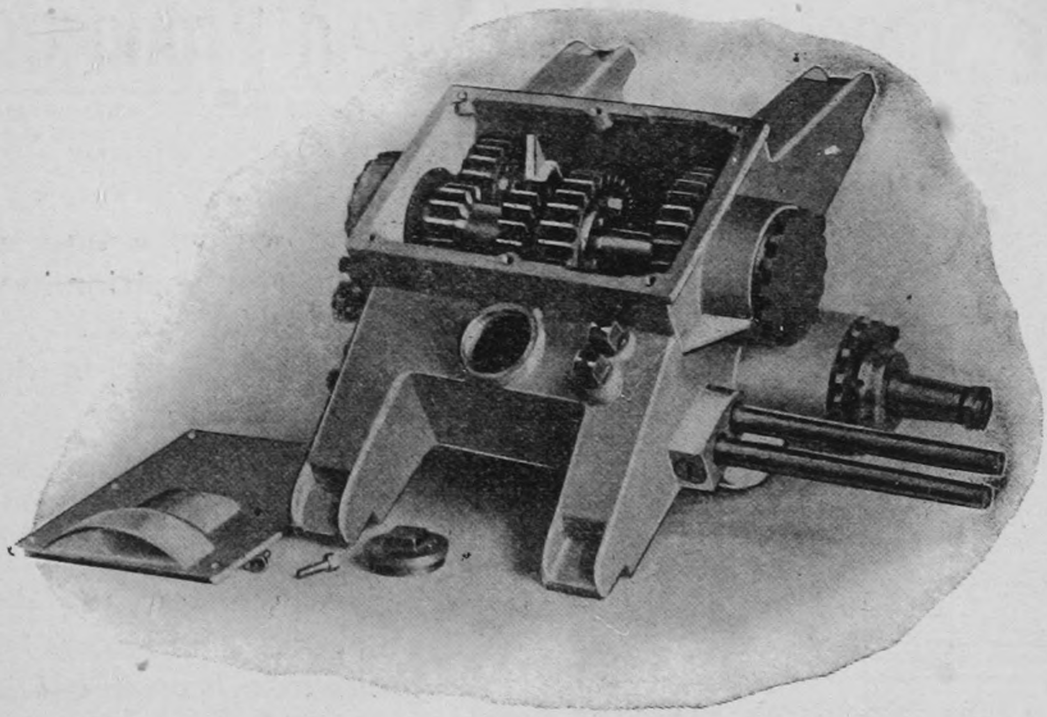
This system is not an experiment — has been sold for the past two years on a positive guarantee of satisfaction, or money back, and has never failed in a single instance to MAKE GOOD. What it has done for others it will do for you. Try it at our risk.

Illustrated descriptive catalog, explaining the System in detail, will be mailed free. Write for it today, before you forget it.

HIGH FREQUENCY IGNITION COIL CO.

We have something of interest
to say to dealers.

2307 Main St., LOS ANGELES, CALIFORNIA



SELECTIVE TYPE AUTOMOBILE TRANSMISSION GEARS.

STYLE 3V, 60 H. P. AND LOWER
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Made in both vertical and horizontal types and fitted with annular ball bearings, as specified.

The gears are made of chrome nickel steel, hardened, treated and ground to size; the shifter rods are fitted with an automatic inner-lock, making it impossible to mesh two gears at one time; the rods are also fitted with registering pawls to automatically lock sliding gears in and out of mesh. All parts are

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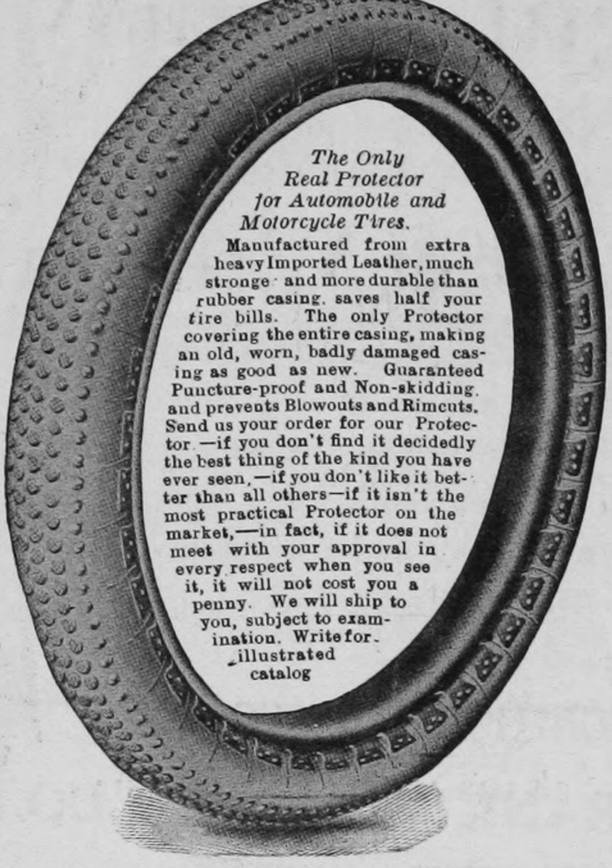

The Only Real Protector for Automobile and Motorcycle Tires.

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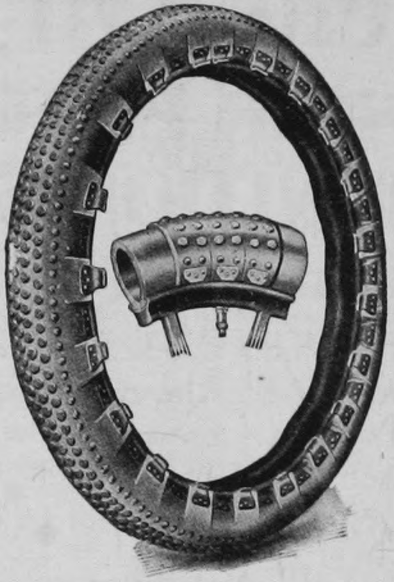

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Emergency Patch, any size tire, post-paid,
and if you don't find it decidedly the best th
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practical Patch on the market,—in fact, if it d
not meet with your approval in every resp
when you see it, it will not cost you a pen
Simply return it to us and we will refund y
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range from $2 to $4. Write for Dealers' a
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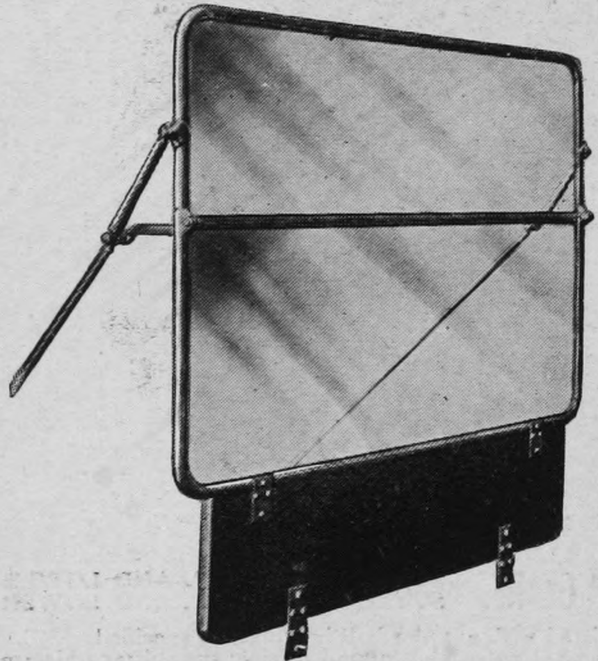
The Smoothest Wind Shield Propositio

EVER BUILT



**Up or down with one han
without changing position in you
seat or slackening speed.**

A positive lock, up or down

No rattle or noise.
No thumb screws to get loose.
No coil springs to break glass.
No rubber bumpers to wear out.

**The best constructed shiel
on the market. Solid brass frame
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Write us to-day for descriptive
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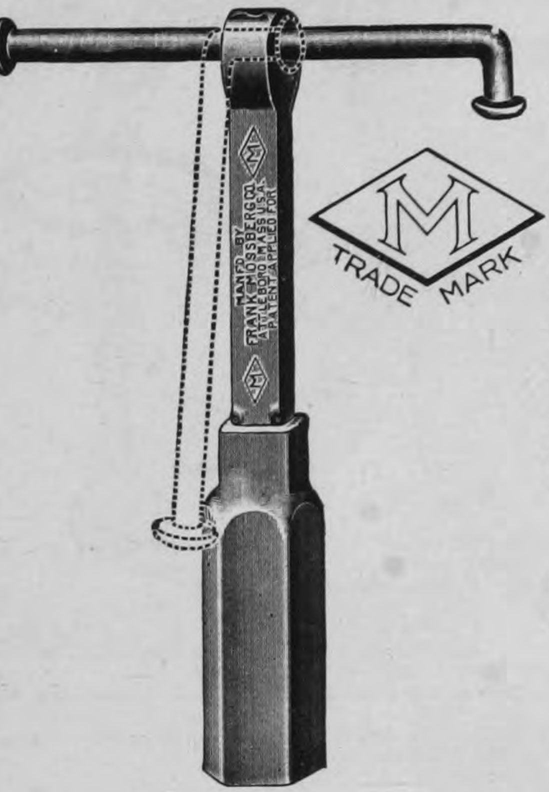
Douglas & Lomason Co

The quality sells the

Sells On Sight So Easy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Socket Wrench

is one of the livest tools they carry in stock. This condition is the direct result of the prompt recognition on the part of automobilists and repair men of its convenience and adaptability.

Furnished with any required assortment of sockets.

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A Crescent Burner for Every Requirement

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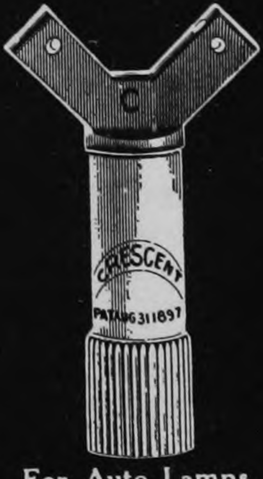
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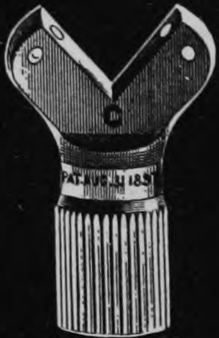
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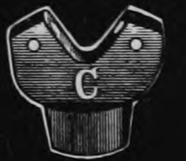

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Made in $\frac{1}{8}$ and $\frac{1}{4}$″ size only

MADE OF GERMAN STONE—GUARANTEED

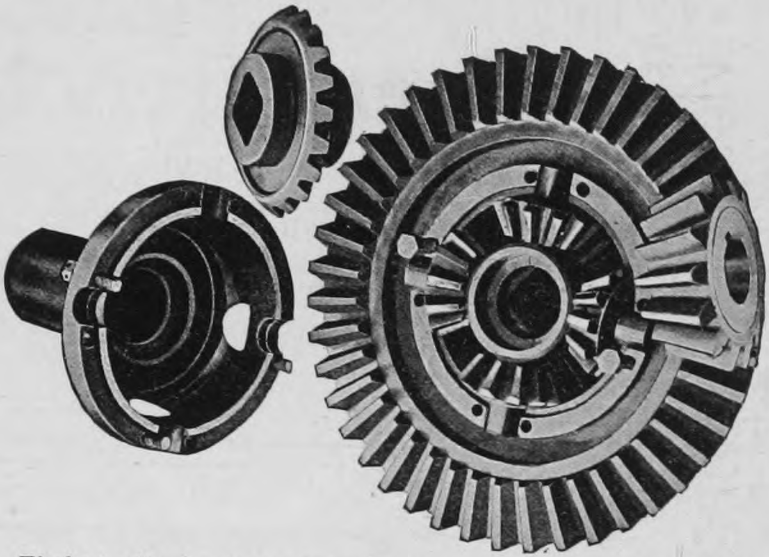
None genuine without marks on Tip and Pillar as above

INSIST UPON THE GENUINE!

For Sale Everywhere

BROWN-LIPE GEARS

Transmission—Differential—Steering



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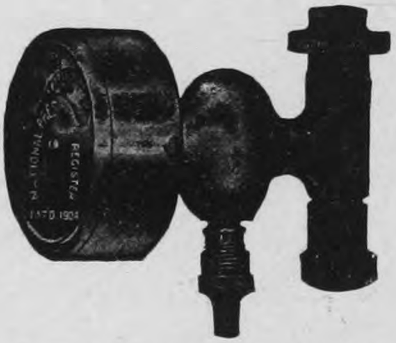

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Manufacturing
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Successors to
Wray Pump &
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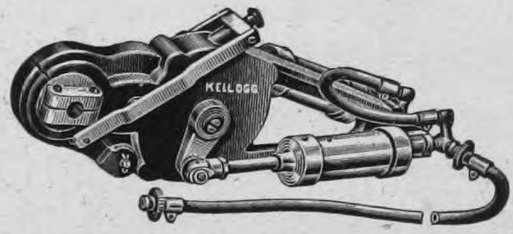

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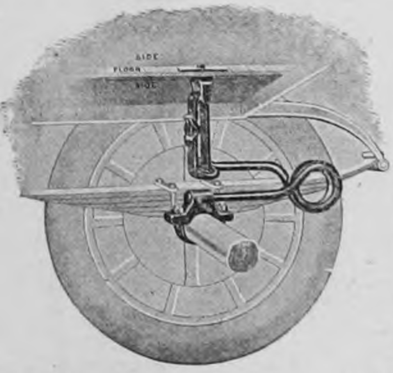
The P. H. Gill & Sons Forge and Machine Works, Lorraine and Otsego Streets, Brooklyn, N. Y. We wish to call the Trade's attention to our Chrome Nickel Steel Crank-Shafts and Gear Blanks, etc., Domestic and Foreign.

NO DROP FORGINGS

We have special adapted Crank Pin Machines for making Crank-Shafts true-round within one-quarter-thousandth of an inch. We also make axles complete, finished or forged only; also all kinds of automobile and marine forgings.

Crank-shafts up to 6″ dia. All anvil-forged, hammered out of Acid O. H. Steel or Nickel Steel or Chrome Nickel Steel.

SAVE YOUR SPRINGS
WITH
Thomas Shock Absorbers



Thomas Shock Absorbers on your car will positively prevent breakage of springs, except in cases of severe accident. They will do other things, too, such as eliminating upthrow. This means less jolt—easier riding—more speed and less wear on tires. Every road, no matter how rough, seems like a paved boulevard with Thomas Shock Absorbers on your car. Experts ay they are perfect. They are easily attached to any car. If, after trying set for 30 days, you do not find them perfectly satisfactory we will efund your money.

Write for particulars and prices.

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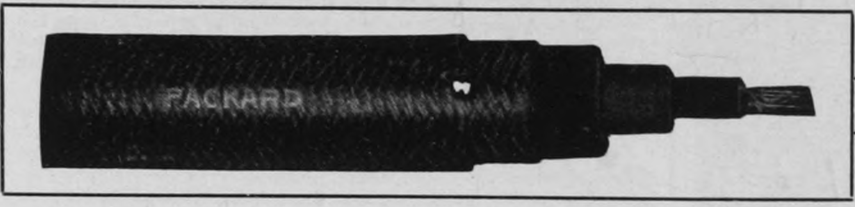

It delivers the entire energy of the spark coil—**and continues this pe formance indefinitely.** It has no equal.

Booklet (in colors) on request.

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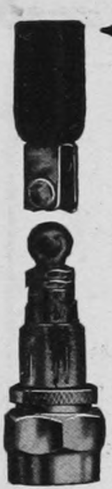

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Show the same care in the selection of your terminals as you do in selecting more important accessories. The

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Fills a long-felt want. It is neat, handsome in finish, reliable and efficient. It is made up in two types suitable for use as a Primary or Secondary connector. Safe to handle — no opportunity to receive a shock. Quick and easy of attachment.

Write for 1910 Catalog

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DETROIT, 225 Jefferson Ave.
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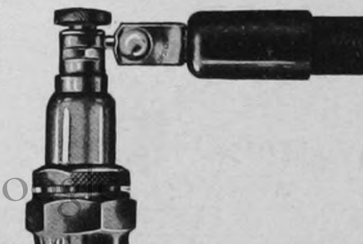

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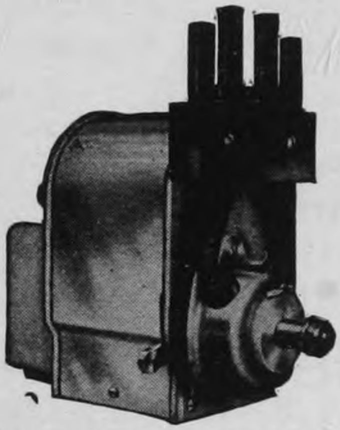
1910 HIGH TENSION MAGNETO 1910

MADE IN AMERICA

PITTSFIELD IGNITION IS THE VERY BEST



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Gentlemen:—I thought you might be interested to know what my experience has been with your Magneto, which I had installed on the Model "O" Knox Car, which I purchased this season, and I am pleased to report that it has never given me a minute's trouble in about 4,000 miles of travel so far, and I am very much pleased with it and shall have one put on the new car which I am ordering for next season.

One great feature that cannot fail to appeal to any person who uses it is the ability to run at very slow speed, say four miles per hour, and still have just as good a spark as at high speed, and then, too, there is practically no need of adjustment because the platinum points do not pit and turn as they do in some other makes.

I can heartily recommend your Magneto to anyone for faithful and consistent service (if let alone); in fact, I have already converted one man and he said he would surely order one for his new car.

Very truly yours,
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Accessories are unexcelled. When ordering for Motor Boat, Motor Car or Motorcycle, remember we make Spark Coils, Spark Plugs, Switches, Magnetos, Timers and Distributors. Insist on their installation. Write to-day for Particulars, Catalogues, Price Lists and Instructions.

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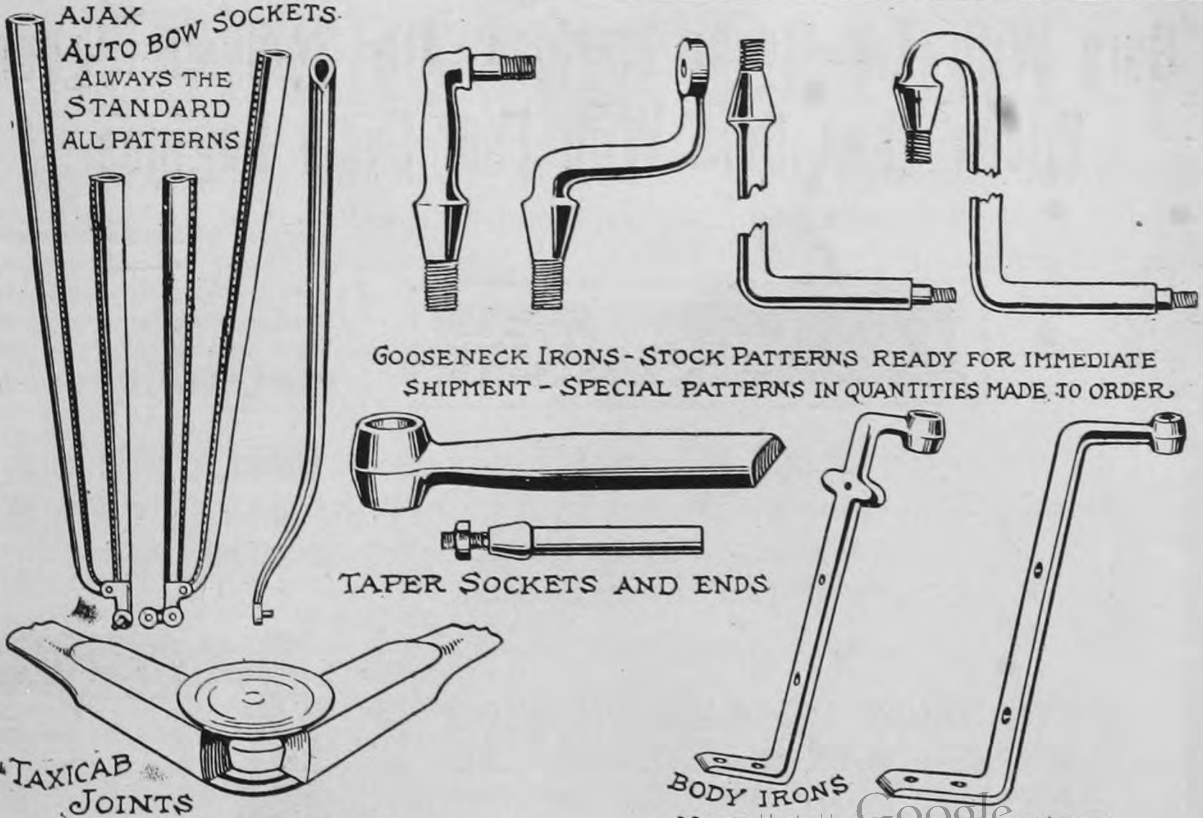

AJAX AUTO BOW SOCKETS
ALWAYS THE STANDARD
ALL PATTERNS

GOOSENECK IRONS - STOCK PATTERNS READY FOR IMMEDIATE SHIPMENT - SPECIAL PATTERNS IN QUANTITIES MADE TO ORDER

TAPER SOCKETS AND ENDS

"TAXICAB" JOINTS
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Chase

Automobile Robes

For All Seasons

¶ Fine Mohair Plush Robes in Plain Colors and Beautiful Fur Effects.

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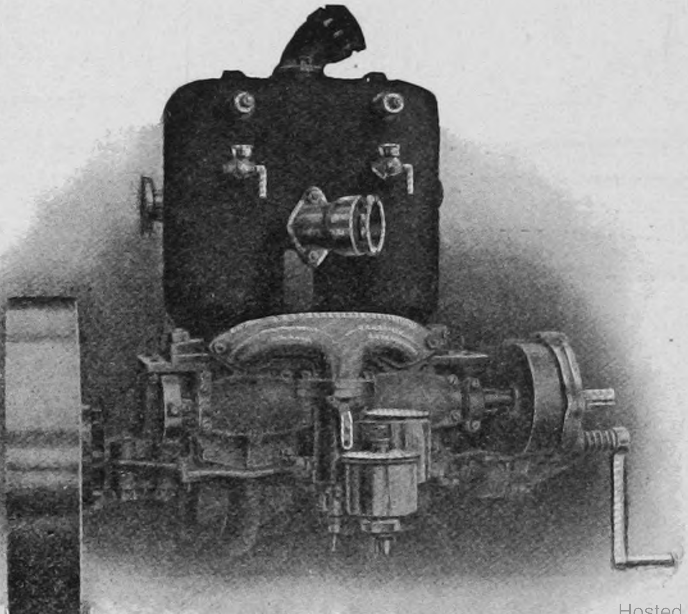
Cars With Two-Cycle Engines Are Sold at Higher Prices Than Cars With Four-Cycle Engines



Why? Because there are so few manufacturers of good two-cycle engine and because the two-cycle engine ha so many features which are superior t the four-cycle type. If you want th best and most efficient motor made you will want the

WILLET
TWO-CYCLE
ENGINE

It represents the maximum of efficiency and reliability with the minimum o trouble and cost of up-keep. It is marvel of simplicity, and the new Rotary valve makes it silent, powerfu and flexible. This valve is self-grinding, adjusting and needs no attention

Made in sizes from
8 to 70 H. P.

VANDERBILT CUP RACE

Seamless Light-weight Tanks

READY 18 INCHES DIAMETER, 30 TO 40 GALLONS

WE MAKE TANKS, BIG AND LITTLE, FOR AUTOMOBILES AND POWER BOATS

PRESSURE

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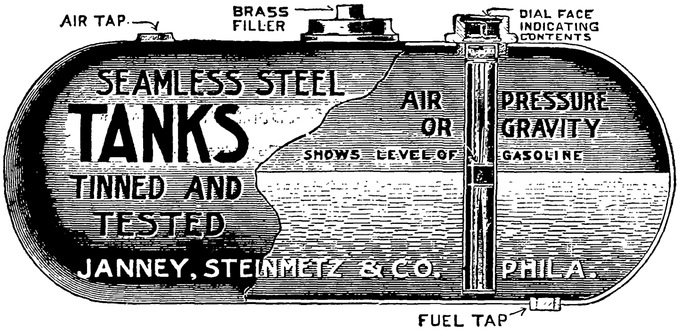
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BRASS FILLER
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SEAMLESS STEEL
TANKS
TINNED AND TESTED
AIR OR
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SHOWS LEVEL OF GASOLINE
JANNEY, STEINMETZ & CO. PHILA.
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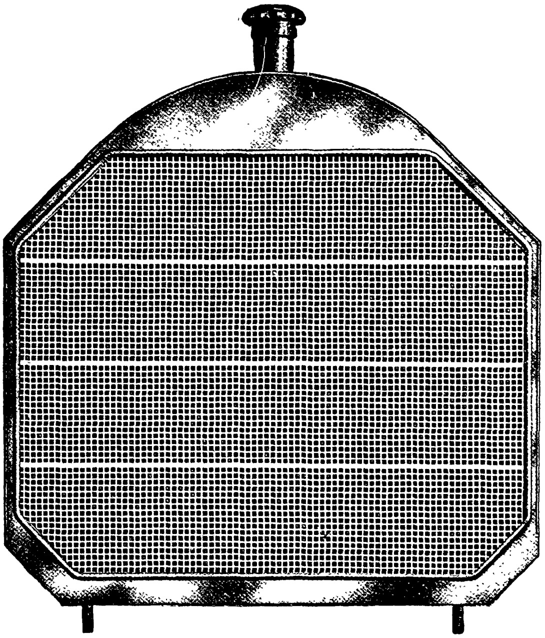
SURE, SAFE, TESTED, RIVETLESS, LEAKLESS

TANKS all sizes, from 1 pint to 100 gallons, SEAMLESS

NEW 1909 TANK CATALOG READY

JANNEY, STEINMETZ & CO. :: PHILADELPHIA AND NEW YORK

FEDDERS Real Square Tube RADIATOR

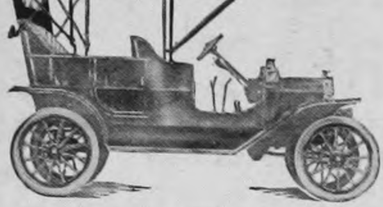


We furnish either our regular staggered tube radiator or the straight lines as shown on cut. **But, remember,** ours is the **real square tube radiator;** no square tube effect or imitation.

We are the only concern making a real square tube radiator.

Of course, the square tube is better—that's why the others imitate it.

Fedders Mfg. Works
57-65 Tonawanda Street
Buffalo :: New York



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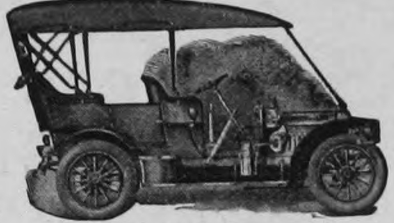
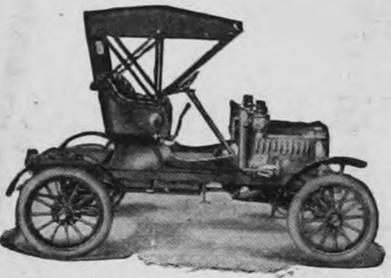


No. 600 Style

TOPS

W. H. Newton & Son, 123 Elm St., Cortland, N.Y.



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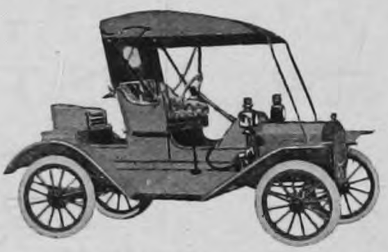
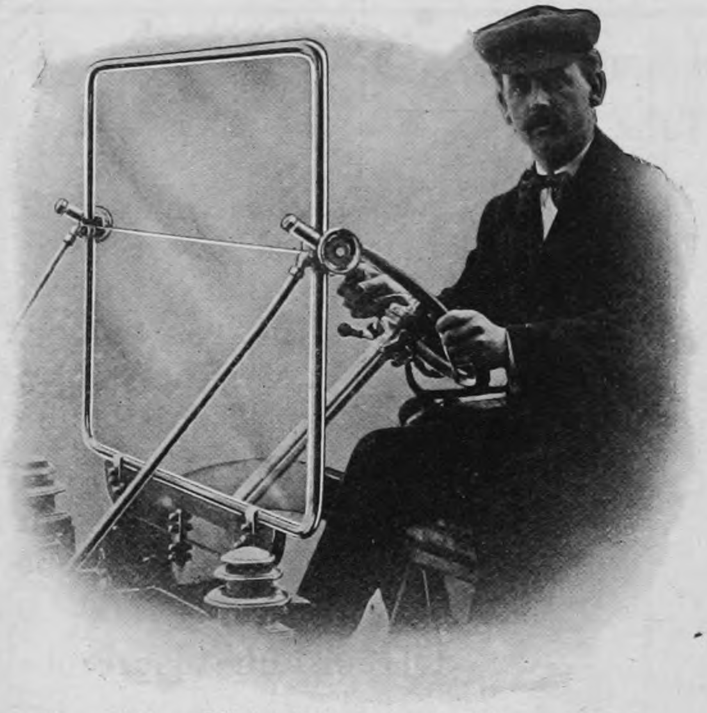
MEASUREMENTS ON HAND FOR FORDS, MAXWELLS, BUICKS, OVERLANDS, CADILLAC 30, CHALMERS-DETROIT; E. M. F., BRUSH, HUDSON, Etc.

Send for Catalogue and Samples



No. 400 Style



Cox "Clear Vision" Automatic Wind Shield

The Only Automatic

"Clear Vision"

Wind Shield made

Has important features not found on any other Shield on the market. Absolutely the best shield made.

ASK US TO PROVE IT

Price, $35.00

COX BRASS

Catalogue Upon Request

Established 1872

Some of Our Specialties

Wind Shields

Robe Rails

Clocks

GORDON

Duplex

Automatic Shield

Folding either way, one-half of the Shield over. It gives the people in the car more air than if only one-third of it was folded over, and it brings the brass cross channel below the range of vision and the driver is not continually rising in his seat or lowering his head to get a clear view of the road.

Should the Shield strike the steering wheel, it can be folded outward.

The action of the Shield is controlled by an oiled tempered spring concealed in the side cylinder, and this spring is guaranteed not to break and will be replaced without any charge at any time. On the end of the plunger is a double action leather valve which works with air.

The frame is made of heavy brass tubing. The hinges are heavy strong manganese brass castings. The brace rods are adjustable and the plate glass is set in rubber channel. A pair of heavy clips to hold the frame to the Shield and heavy clips to hold the Shield to the filler board are furnished. Rubber bumpers are fitted in the clips which hold the frame to the filler board and the Shield cannot rattle when folded over.

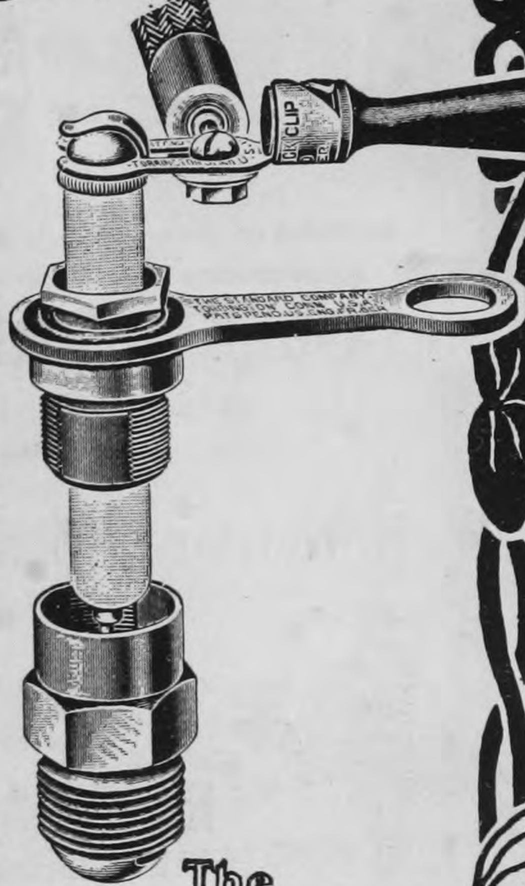
With every Shield we furnish a mahogany filler board 36″ long, 6″ high, and if specified we can furnish a board 9″ high or 12″ high with 44″ Shield, 40″ board is furnished.

The Shield is made in 3 sizes, all being 28″ high, and for runabouts are 37″ wide, for medium touring cars 41″ wide, and for large touring cars 44″ wide.

We do not cut filler boards, as there are several hundred makes of automobiles, each with a different dash, and it is utterly impossible to fit different dashes without accurate patterns. Any carpenter can cut the board to fit the dash in a few minutes, or you can do it yourself. The boards are grooved on the top edge to fit the round brass frame of the Shield.

No.	**Shield, 37 inches wide..........**	**$25.00**
No.	**Shield, 41 inches wide..........**	**25.00**
No.	**Shield, 44 inches wide..........**	**27.50**

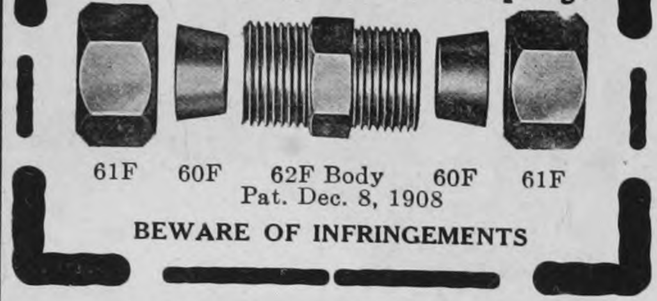
Nickel plated or gun metal finish, $5.00 extra.



The "Breech-Block" Plug

$1 EA.

THE STANDARD COMPANY
TORRINGTON
CONN.


61F
60F
62F Body
60F
61F
Pat. Dec. 8, 1908
BEWARE OF INFRINGEMENTS

BRASS WORK

TO ORDER

Send us your specifications and we will be pleased to quote you interesting prices on your BRASS WORK.

Our IMPERIAL SPECIALTIES

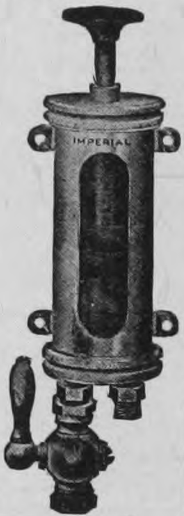
Include:

Air Pumps	Oil Pumps
Water Pumps	Grease Cups
Foot Rails	Robe Rails
Gasoline Strainers	Tire Pumps
Priming Cups	Gasoline Cocks
Gasoline Tanks	Name Plates

Pressure Regulators

and AUTOMOBILE brass work of every description.

Write for Catalog



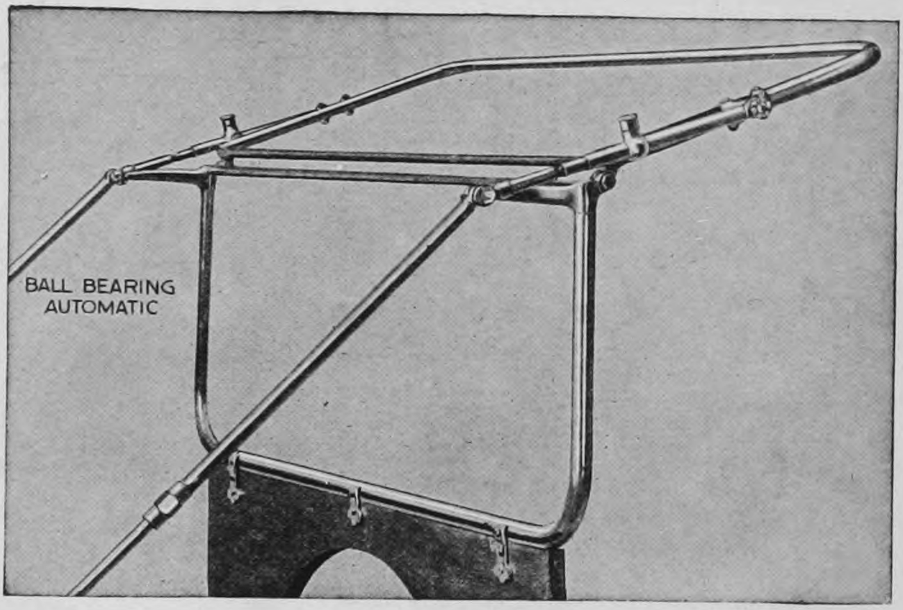
IMPERIAL BRASS MFG. CO.

441 S. Jefferson Street :: CHICAGO

1910

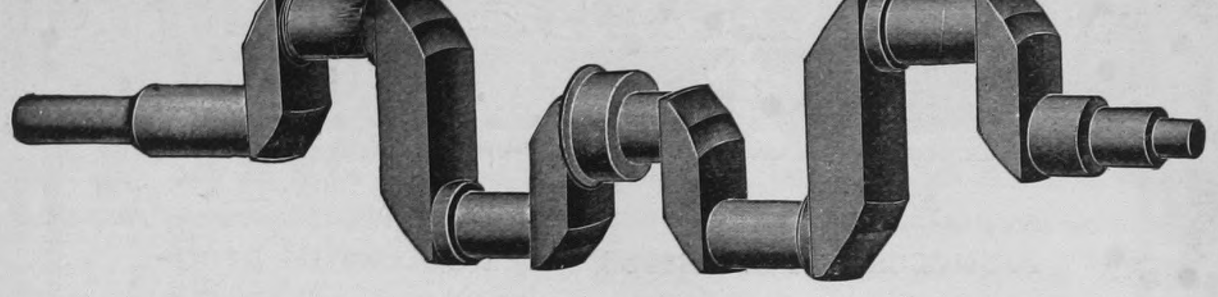
The Avalon Adjustable

$25.00


BALL BEARING
AUTOMATIC

A positive lock when raised. A positive lock when lowered. An all brass shield at the price of a wood shield. No rattle.

Ball-Fintze Co.



¶ A few cents saved when buying CRANKSHAFTS means dollars spent in making good a guarantee.

¶ The Crankshaft is the back-bone of the engine and can be none too good for the work it has to perform.

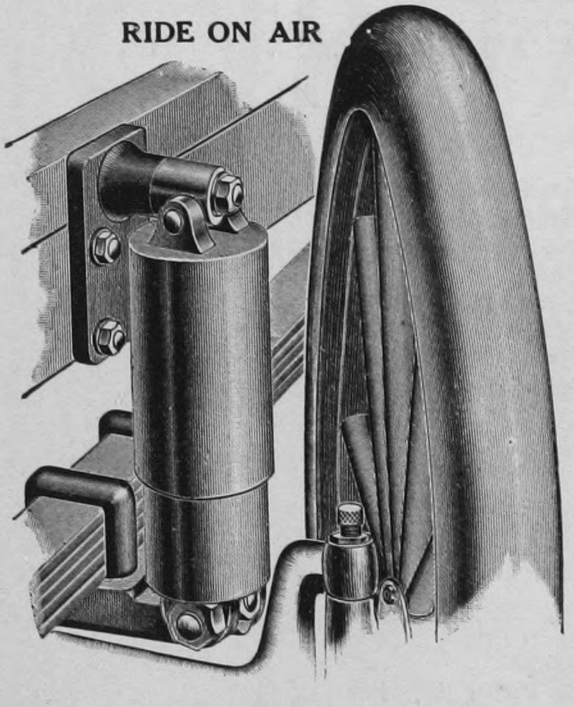
¶ You run no risk if you send us your blue prints and let us estimate for your next season's needs.

¶ Our Crankshafts have stood the test of time and have eliminated one of the weak features of motor car construction.

STANDARD CONNECTING ROD CO.

BEAVER FALLS, PA.

SHOCK ABSORBER ECONOMY



PATENTED U. S. AND ALL FOREIGN COUNTRIES

means the use of the best. Nothing is so dear as that which is cheap. The

KILGORE IMPROVED AUTOMOBILE AIR SHOCK ABSORBER

costs more to manufacture than any other shock absorber in the world. Why? Because it is made of the best material by the best of workmen. The principle is correct. Anyone will tell you that AIR is a more flexible and better controlling medium than liquid or friction.

Kilgores absorb the excessive spring motion both DOWN and UP and yet allow the normal spring play on good roads. No attention necessary after once adjusting to spring play.

Save their cost in repairs and tires, to say nothing of the added comfort in riding, in a very few months. Fully guaranteed.

We allow a 30-days trial to give the motoring public a chance to test the superiority and easy riding qualities of the Kilgore. In ordering state make, model and year of car.

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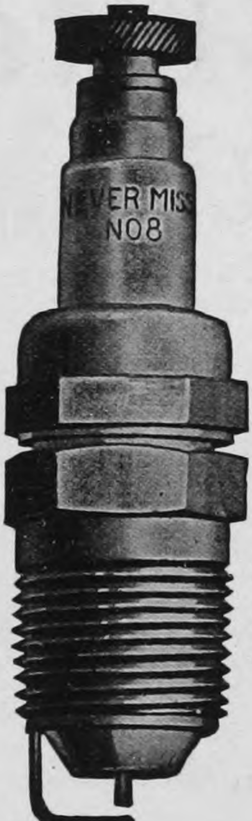
HIGH GRADE AXLES
FOR MOTOR CARS

A successful business or a successful product is but the expression of a central idea.

The central idea back of Timken-Detroit Axles is—and always has been—QUALITY.

That's why our Guaranty means so much; why seventy per cent of automobile makers use Timken products.

Made in Detroit By
THE TIMKEN-DETROIT AXLE CO.



PERHAPS

When all of us own motor cars
And women cease to talk,
When rubies, diamonds and pearls
Are just as cheap as chalk;
When Taft trains down to ninety pounds
And headaches "don't" exist,
PERHAPS you'll find a Spark Plug
Just as good as NEVER MISS.
—*Our Office Boy.*

Guaranteed for one year's actual service. Just a dollar for any size. Wide-awake jobbers and dealers from Maine to California can supply you. Insist on

Never-Miss No. 8

The REAL Spark Plug

SUPPLEMENTARY

SPIRAL SPRINGS

The Pioneer Shock Absorbers. Made on the right principles in the first place, they have stood the test of time and are today universally conceded to be the greatest device in the world for saving your car.

THE SPRING OF FAME
PATENTED DEC. 18, 1906
TRADE MARK REGISTERED U.S. PATENT OFFICE
MFGD. BY SUPPLEMENTARY SPIRAL SPRING CO. ST. LOUIS

You can't buy better shock absorbers than SUPPLEMENTARY SPIRAL SPRINGS because there aren't any better.

Send for copies of letters from users, giving their actual experiences with **SUPPLEMENTARY SPRINGS.**

St. Louis Supplementary Spiral Spring Co., **4522 Delmar Avenue**
ST. LOUIS, MO.

New York Office: 1876 Broadway, Room 202

BRANCHES:—BOSTON, 893 Boylston St.; CHICAGO, 233-237 E. Randolph St.; PACIFIC COAST, 424 Stanyan St., San Francisco; TORONTO, ONTARIO, CANADA, T. Eaton Company.

Prest-O-Lite

A New Emergency Size

Twenty Hours of Light Carried in Your Tool Box

If you should forget to investigate your supply of light until too late—

This little tank in your tool box gives you 20 hours of light, for emergencies.

It is our regular Motorcycle tank, 12 inches long and 4 inches in diameter. Weighs only 7 lbs. Simply carry some extra rubber tubing and connect it in a moment.

Prest-O-Lite (Motorcycle Size), $10

Full Tank, in Exchange for empty, 60c.

Capacity for Motorcycles, 40 hours, with ½ ft. burner.

The Prest-O-Lite Co., **237 East South Street**
Indianapolis, Ind.

Branches at New York, Boston, Philadelphia,
Cleveland, San Francisco and Toronto.

4000 Exchange Agents

Pumpelly Storage Batteries

HOLD THE

World's Racing Records

For Everything from 30 to 100 Miles

Every manufacturer, every driver knows what that means. To stand the jolts and jars and give absolutely steady, strong ignition means a battery that is

BUILT JUST RIGHT

Unit construction of course. Our patent grids are so designed that **plates cannot disintegrate.** Perfect circulation and entire freedom from short circuiting. Electric vehicles equipped with Pumpelly Batteries run longer, faster and at less expense for charging than any others. Electric lights run from Pumpelly Batteries burn longer than any others.

Ask for our little book—

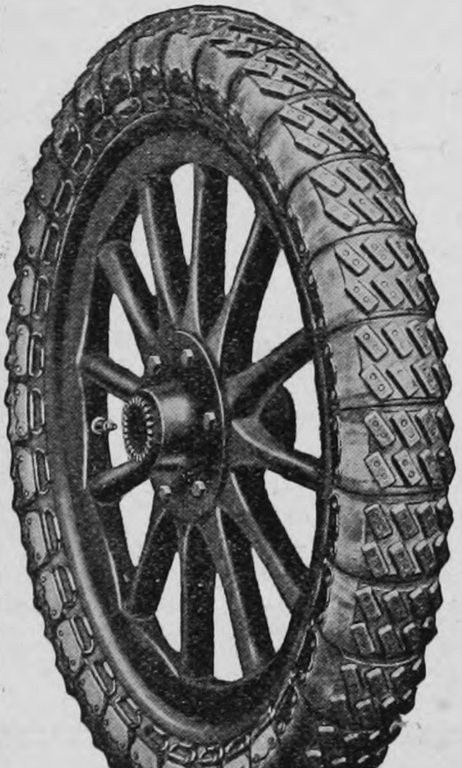
"The How and Why of Batteries."

PUMPELLY BATTERY CO.
1204 E. 22d St. Indianapolis, Ind.

WALKER AUTO TIRE BANDS

DO THE BUSINESS

Six Months' Service and Still Good



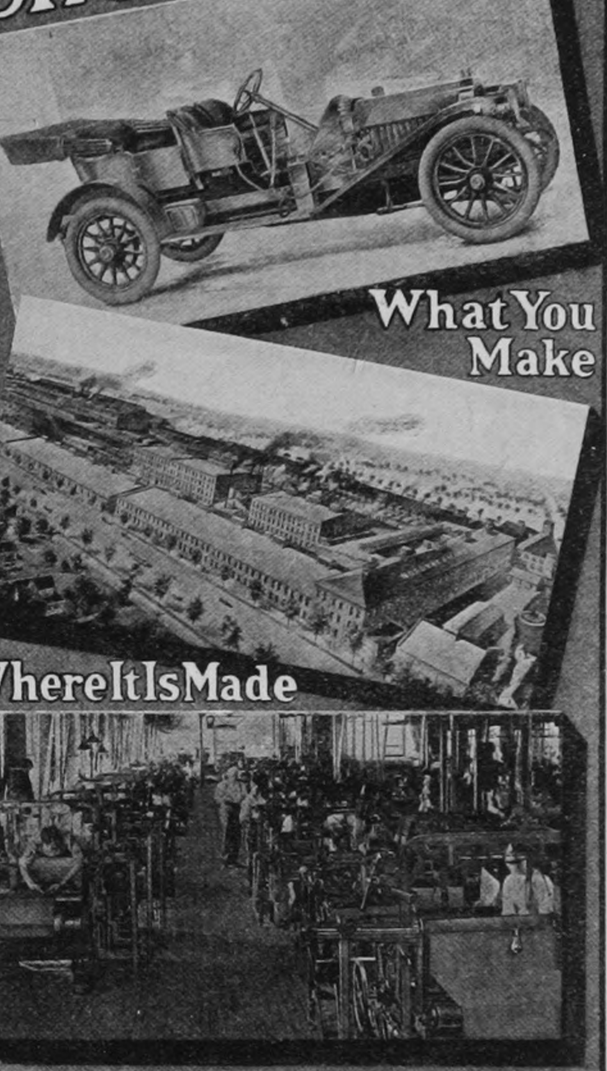
Three to five thousand miles with no rim cuts, stone cuts, glass cuts, blowouts, tack or nail punctures, no tire expense, delay or inconvenience, no fears of skidding or spinning, no tire troubles of any description, just pleasure, pure and simple. This is what WALKER AUTO TIRE BANDS HAVE DONE for the Indianapolis Fire Chief. They will do as much for you.

WHAT'S THE USE

of having tire trouble and expense when our Bands will put a stop to both? No resilience lost, no power lost, no injury to the tires. Makes any old tire serviceable for years. Costs about half the price of a new tire and saves the necessity of carrying extra casings. **Do it now.** Don't put off till tomorrow what you ought to do today. Buy a set of WALKER AUTO TIRE BANDS at once and you will never have occasion to regret it.

Price list and descriptive circulars on application.

WALKER AUTO TIRE BAND CO.



And How You Make It

EVERYONE prefers to have business dealings with successful houses. You have exceptional facilities, but do the buyers you want to reach know it?

Show them by using a series of

CHILTON ADVERTISING
POST CARDS IN COLORS

illustrating your plant and product.

Twenty-three orders in one day is the record of a client.

May we outline an equally successful campaign for you?

HILTONN PRINTING CO.
MARKET & 49th STS. PHILADELPHIA

Knox
Representatives

Located in Leading Large Cities

Bailey & Bowne, Cor. Whitesboro and and Wiley Sts., Utica, N. Y.
Benjamin, C. Arthur, Inc., 410 W. Onondaga St., Syracuse, N. Y.
Bennett Automobile Company, 315 Nebraska St., Sioux City, Iowa.
Burguieres, D. P. J., Louisa P. O., La.
Central Automobile Co., 130-132 Quail St., Albany, N. Y.
Close Brothers, 405 Smith St., Schenectady, N. Y.
Conduit Auto Company, 332 N. Delaware St., Indianapolis, Ind.
Co-Operative Motor Car Co., 889 Main St., Buffalo, N. Y.
DeGaston, Alfred H., Denver, Colo.
Dow, F. F., Mechanicsville, Vt.
Franklin Square Garage, 3 Allen Court, Worcester, Mass.
Glens Falls Automobile Co., Glens Falls, N. Y.
Greenwood Bros. & Company, Station A, Gardner, Mass.
Griffin Garage, M., Park Ave. and Howard St., Baltimore, Md.
Hale, E. T., 166 St. John St., New Haven, Conn.
Hiland Automobile Company, 5811 Centre Ave., Pittsburg, Pa.
Hitchcock-Banks Motor Car Company, 179 Aborn St., Providence, R. I.
Holyoke Automobile Company, 12 Crescent St., Holyoke, Mass.
Jarrard, O. O., Mauch Chunk, Pa.
Johnston, Robert, Wilkes-Barre, Pa.
Kirk Bros. Automobile Company, 915 Jefferson Ave., Toledo, O.
Knox Automobile Co., 1966 Broadway, N. Y. City.
Knox Automobile Company of Illinois, 1458 Michigan Ave., Chicago, Ill.
Lee Motor Car Company, 102 N. Robinson St., Oklahoma City, Okla.
Lowell Automobile Company, Appleton St. and P. O. Ave., Lowell, Mass.
MacDonald, James L., 5093 Washington Ave., St. Louis, Mo.
Martin, W. E., Bethlehem, Pa.
Mich-Stair Automobile Company, 917 Hennepin Ave., Minneapolis, Minn.
Munger Automobile Company, Dallas, Texas.
Murdock, F. L., 41 W. Main St., Meriden, Conn.
New Hampshire Auto Company, Concord, N. H.
Newton, J. E., Fall River, Mass.
North Philadelphia Auto Station, 3425 N. Broad St., Philadelphia, Pa.
Northwest Automobile Supply Company, 1419 First Ave., Spokane, Wash.
Portland Company, The, 58 Fore Street, Portland, Maine.
Reliance Automobile Company, 342 Van Ness Ave., San Francisco, Cal.
S. B. & E. Automobile Company, 2245 Spring Grove Ave., Cincinnati, O.
Scranton Automobile Company, Scranton, Pa.
Snow, F. J., Rockville, Conn.
Staacke, A. E., Auto Co., 113 W. Crockett St., San Antonio, Texas.
Tamblin, Dr. J. H., Copenhagen, N. Y.
Townsend, A. R., 1148 Bedford Ave., Brooklyn, N. Y.
Underhill Company, The, 222 Columbus Ave., Boston, Mass.
Vanstone, C. W., 65 Kossuth St., Bridgeport, Conn.
Western Auto Company, Seventh and Couch Sts., Portland, Ore.
Woodward Automobile Company, 1912 Grand Ave., Kansas City, Mo.

Territory Still Open

Although our product for 1910 is nearly all allotted, we are especially interested at this time in closing with responsible parties that are in position to give our line good representation in a few large centers in which we have no agents, as follows. Write us.

Rochester, N. Y.
Detroit, Mich.
Omaha, Neb.
Seattle, Wash.
Atlanta, Ga.
Erie, Pa.
Louisville, Ky.
Des Moines, Iowa
Los Angeles, Cal.
Milwaukee, Wis.
Dayton, Ohio.
Salt Lake City, Utah.
Ogden, Utah.
New Orleans, La.
Washington, D. C.

Knox 1910 Models

will be on exhibition at the **Atlanta Automobile Show**, November 6th to 13th, and also at the Licensed Shows in New York and Chicago.

Write for Catalog and Information

Tires and Accessories

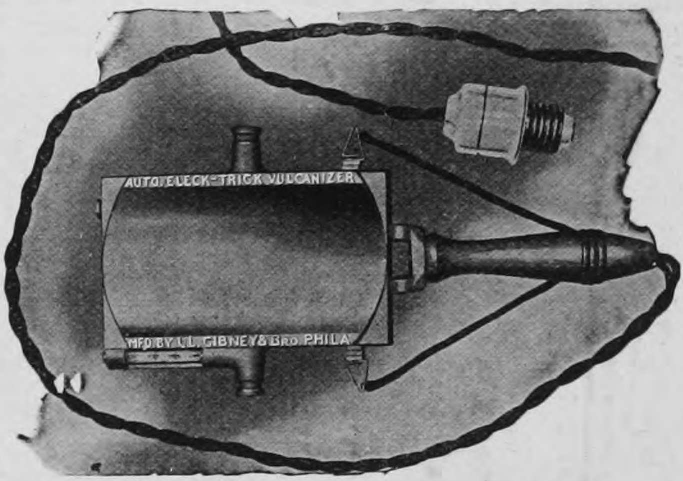
Only dependable goods of standard quality can be bought from

GIBNEY

The personal service which we give our customers and our persistent endeavors to sell the right goods at the right prices have made this one of the largest places of its kind in the country. We invite your inspection.

Do Your Own Repair Work With An

AUTO ELECK-TRICK VULCANIZER



The simplest, surest, most convenient tire repairing instrument on the market. Hundreds of owners and garage men are using them with complete satisfaction.

$12

with repair material, etc.

JAMES L. GIBNEY & BRO. Philadelphia, U.S.A.

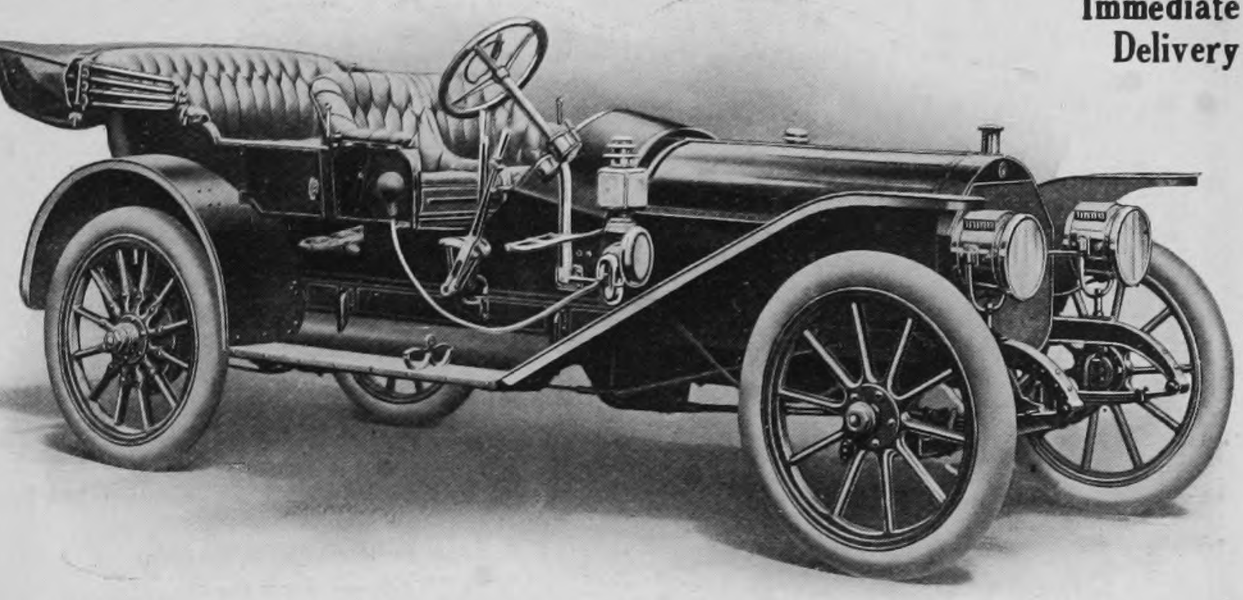
Sat isfied
ustomers

Matheson

der the Selden
Patent

910 Six-Cylinder 50 h. p., $3,000 Equipped with choice of toy tonneau, touring, runabout, tourabout, or close-coupled bodies

Immediate Delivery



The Matheson Six is the swiftest, the most economical in fuel consumption and tire wear, the most comfortable, e most thoroughly mechanical and the handsomest six-cylinder car on the market, regardless of price. This is r guarantee. You are the judge.

Also the 1910 Matheson Four, the very finest of all four-cylinder cars, immediate delivery of Touring Car, 5,000, Toy Tonneau, $4,750, and Limousine or Landaulet, $5,750.

MATHESON AUTOMOBILE CO., Main Sales Office, 1886-1888 Broadway, N. Y. City

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A New Era Began in Automobile Bearings

WHEN

In July, 1907

THERE WERE MANUFACTURED IN THIS COUNTRY

100 FINISHED CASTINGS

OF

PARSON'S WHITE BRASS

PER MONTH. **WE MADE THEM**

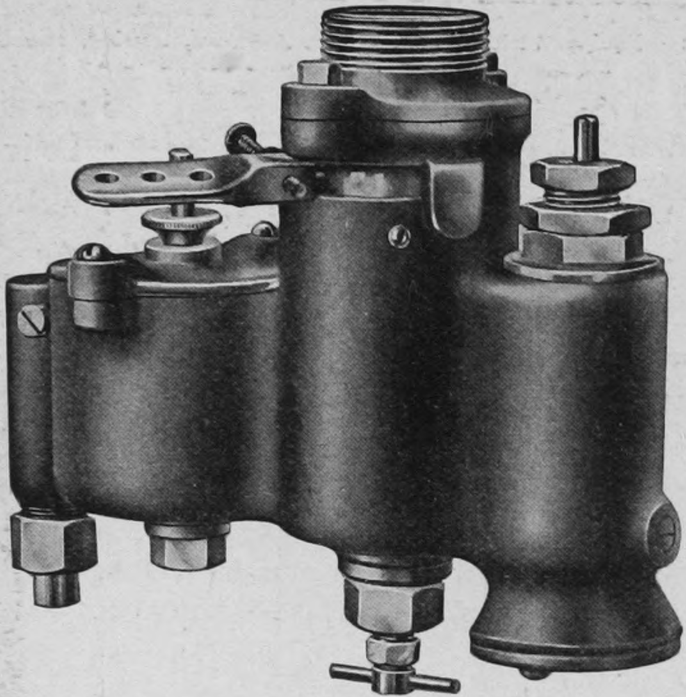
In July, 1909

WE ARE MAKING OVER

500 Per Hour

A few others are being made, but they somehow do not seem to go. Inquiries accompanied by blue-prints will be promptly and intelligently answered.

The Sherwood "Model K" Carburetor



Has Three Jets,

each in a separate mixing chamber and all controlled by one throttle.

Power--Flexibility

Perfect Motor Control

and Economy are

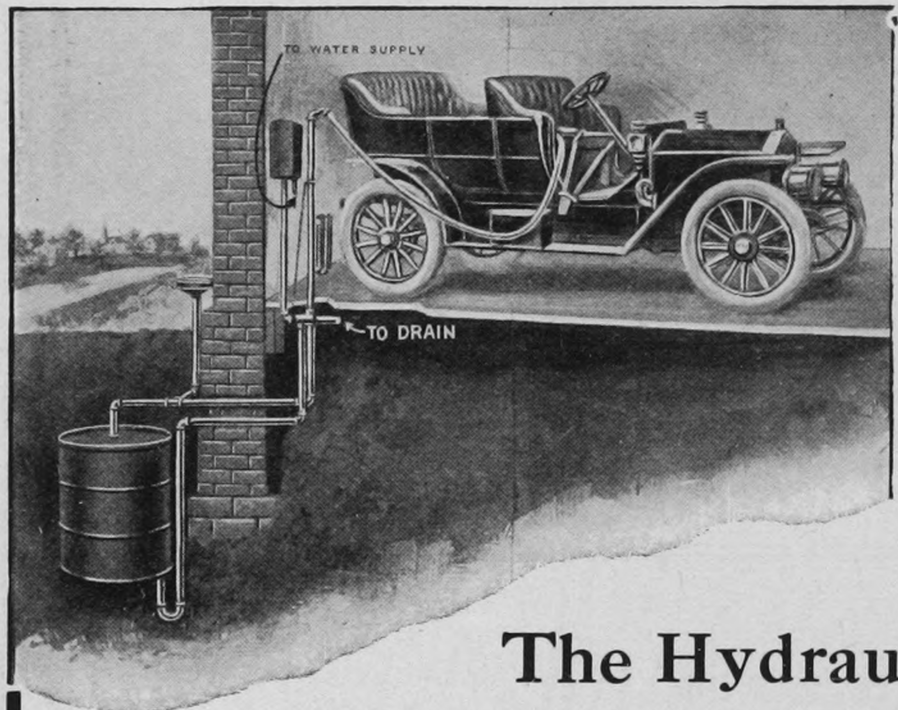
the Results and

One Gasolene Adjustment Does It

Write for Circular
Giving Full Information.

Manufactured by

Sherwood Manufacturing Co., Buffalo, New York



The HYDRAULIC System of Gasolene Storage MEANS

FULL TANK
TOP FEED

NO
DIRT
WATER
DANGER
STRAINING
EVAPORATION
DETERIORATION

None of these possible by any other system

The Hydraulic System

has been adopted by the largest Taxicab Companies, Automobile Factories and Garages in America. We have made the largest Garage and Factory installations in the world. The **Hydraulic System** works equally as well for a one-barrel plant as for 250,000 gallons. For full details write

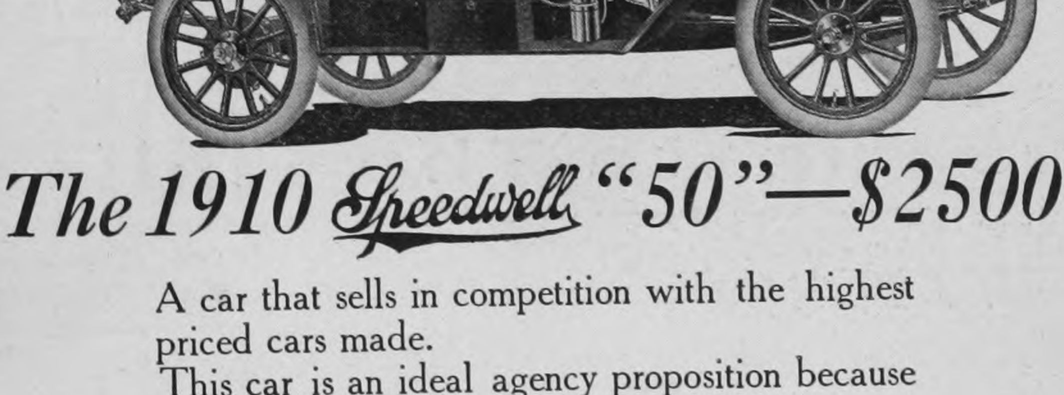
Don't Get the WRONG Warner

WARNER MFG. Cº

T. W. WARNER, PRES. & GEN. MGR.

.. *of* TOLEDO, OHIO ..

THIS Company has no connection whatever with any other concern, either in the Automobile or parts manufacturing business, except our Muncie, Indiana, branch, the T. W. WARNER CO., manufacturing GEAR SHIFT LEVERS, TRANSMISSIONS, DIFFERENTIALS, and STEERING GEARS. Now booking 1911 contracts, but can handle a limited amount of 1910 business. $250,000.00 invested in machinery and tools. 75,000 square feet floor space. Capacity, 500 men.



The 1910 Speedwell "50"—$2500

A car that sells in competition with the highest priced cars made.

This car is an ideal agency proposition because it meets the demands of the discriminating automobile buyer for **size, power, appearance, long service** and **all 'round efficiency** and because an extensive national advertising campaign is bringing the SPEEDWELL to the

San Francisco Branch

For Bosch Magneto Company

To keep pace with the remarkable growth of its business in the West, the BOSCH MAGNETO COMPANY has opened a Branch Office at 357 Van Ness Ave., San Francisco.

This office is supplied with a full assortment of the various types of BOSCH Magnetos (together with spare parts and fittings) for Motor Cars, Motor Cycles, Motor Boats, Stationary Gas Engines and Air Ships.

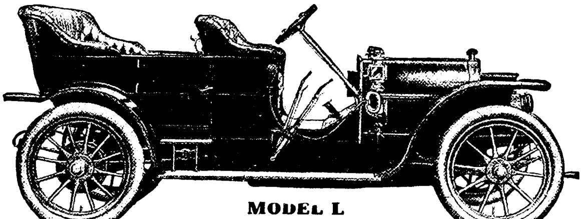
A corps of competent electrical engineers will always be on hand, and their services for consultation and advice on Magnetos and Ignition are to be had without charge.

The New Branch is Located at 357 Van Ness Avenue, San Francisco

BOSCH MAGNETO CO.

223-225 West 46th St., New York Chicago Branch: 1253 Michigan Ave.

MIDLAND



MODEL L
4 Cyl., 35 Horsepower

Investigate The Midland

You will never know what extreme values are open to the man who investigates until you learn the facts about the Model L "Midland."

The Model L "Midland" was a pilot car in the Munsey Reliability run—and the car had been driven 5000 miles before it entered the contest. It was a stock car not specially constructed for the event; yet it covered itself with glory all the way.

In the Philadelphia-Seattle relay race a Model L "Midland" was used between Dixon, Ill., and Mt. Vernon, Ia., It completed this run of 120 miles in 4 hours and 55 minutes without a mishap. This includes time waiting for and on board ferry at Clinton, while crossing the Mississippi. Compare this with showing made by other cars making up the relay.

The great reserve power and perfect performance of the Model L, under conditions of the most extreme severity, are a constant source of wonder and gratification to those who have been wise enough to buy Quality rather than moss-grown reputation.

MODEL L, 1910, $1750; with Touring Car, Toy Tonneau or Roadster Body

A notable feature of this sturdy car is the unit power plant, and three point suspension. No strain or stress can destroy the perfect alignment of driving elements.

The flywheel and clutch are completely encased. This insures perfect alignment of the crank shaft, prevents unnecessary friction, and results in a maximum of power being delivered to the rear wheels.

Cylinders are cast in pairs with valves on opposite sides. The lubrication system is the same as used on the highest priced cars.

The springs are ¾ elliptic rear, semi-elliptic front—standard construction

All brakes are inside the drums, two sets on each wheel—dust-proof and anti-rattle.

The Model L "Midland" is such a marvel of construction, so powerful, sweet running and easy to control—and above all, so durable—that it is an easy car to sell to the man who makes comparisons.

MIDLAND MOTOR CAR CO., Moline, Ill.

Gas and Gasolene

ENGINE

VALVES

We are specializing in the Forging of High Nickel Alloy for this purpose.

We are Succeeding—Present orders prove Material Right—Workmanship Right—Prices Right.

Ask for list and prices of over one hundred stock die sizes.

We also make Drop Forgings generally.

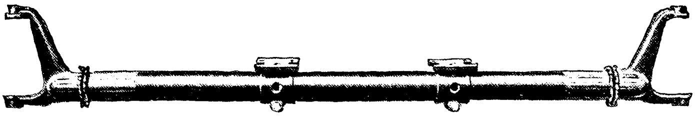
Crescent Forgings Company
OAKMONT, PENNA.

ELECTRIC

You can't fully
appreciate the importance of

ELECTRIC WELDING

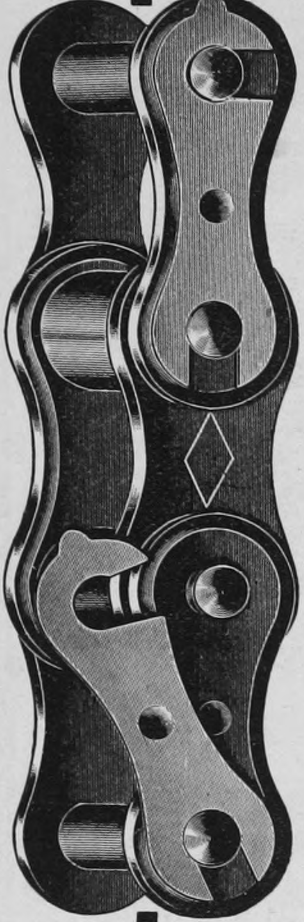
until you have given it an actual test. We have established a reputation as being the most successful company that has ever launched out into the electric welding proposition on a large scale.



We have accomplished many wonderful results, as is evidenced by our marked success, and the assistance we have been to the automobile industry. Your inquiries will be thankfully received and have prompt attention.

THE STANDARD WELDING CO.
CLEVELAND

WELDING



Severe Service does NOT hurt

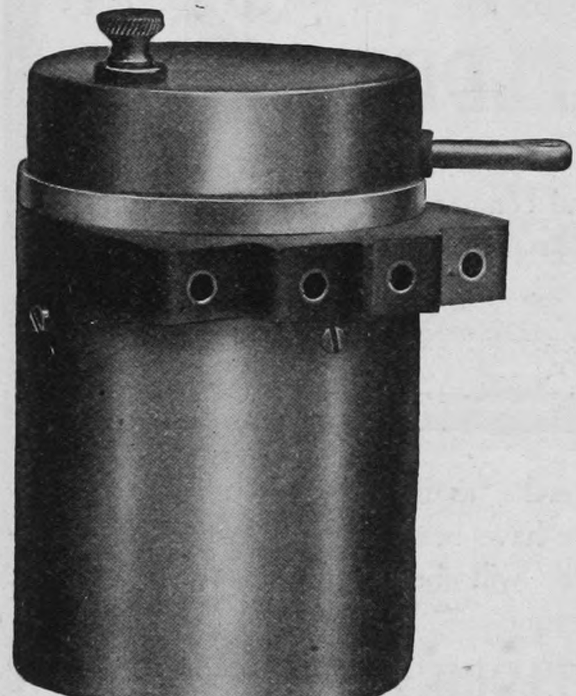
Diamond Chains

¶ HERETOFORE, chains that were hard driven have elongated unduly. There is no chance for such trouble with Diamond Chains, for our new chrome nickel steel side bars, our tough nickel steel rivets and our new process of hardening all wearing surfaces makes a combination that is practically wear and stretch proof. This quality of being able to retain its pitch permits a Diamond Chain to run smoothly even after long life and steady service.

¶ Diamond Chains are made in sizes to fit any American car and sold by dealers everywhere. If you can't get them, tell us your dealer's name and your requirements. Ask for list of cars on which Diamond Chains are used.

Diamond Chain & Mfg. Company
260 W. Georgia Street .. .. INDIANAPOLIS, IND.
Capacity 8,000,000 *feet per year*

THE B. & S. IGNITER

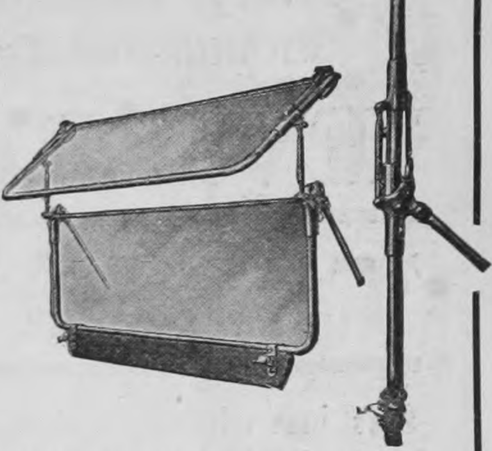


Is a Better Regular Ignitio
Equipment than ANY Magnet

¶ It's construction is thoroughly high grade; equal in every respect to the be foreign magnetos; better than many other

¶ It produces a more uniform spark an consumes less current than any other ign tion system in the world.

¶ Want us to tell you all about it?



"BREECH-LOCK"

THE name sounds good, and the click of the lock when the Shield is being lowered or raised is the only noise about the **"BREECH-LOCK."** Vibration only tightens the locking device.

¶ In many cases, a hunter's life depends on his Breech-loading rifle, yet he never gives this feature of the gun a thought. **WHY?** Because the mechanical principles applied in the construction of a Breech-loading gun are everywhere accepted as absolutely dependable.

¶ Our newly patented **"BREECH-LOCK"** Wind Shield is constructed on these same old and tried principles. The **"BREECH-LOCK"** Shield is lowered by pulling a trigger on either side and raised with one hand, locking automatically.

¶ Dealers can have our beautifully illustrated Catalogue describing our line in detail for the asking.

¶ Our exceptional facilities and immense production places us in a position which enables us to give you greater profits than ever before.

¶ Write to-day for Catalogue and prices.

Branch, 1427 Michigan Ave., Chicago, Ill. VANGUARD COMPANY OF NEW YORK, DISTRIBUTORS FOR NEW YORK, NEW JERSEY and the NEW ENGLAND STATES

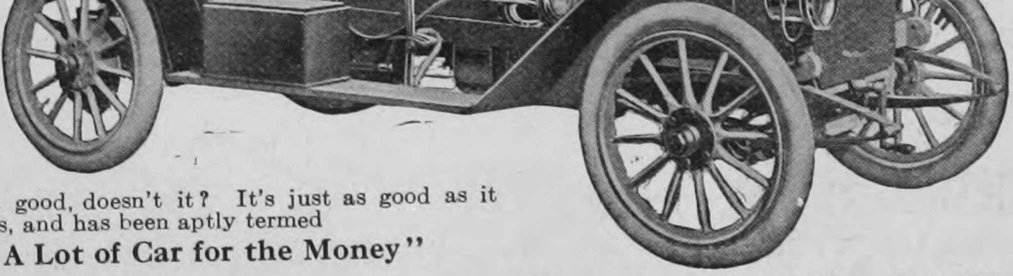
VANGUARD MANUFACTURING CO., Dept. "C," JOLIET, ILL.

Pickard

MANUFACTURERS

Why Pay More
when you can buy Model E for
$750

"A Lot of Car for the Money"



It looks good, doesn't it? It's just as good as it looks, and has been aptly termed

"A Lot of Car for the Money"

With Rumble Seat, which is known as Model F, $800. Touring Car, Model H, $850. Surrey, Model G, $825. We also make four other models, which are respectively known as Model A, $1400; Model B, $1400; Model C, $1450; and Model D, $1500.

Every Taxicab Owner
Should Investigate The

"Ever Ready"

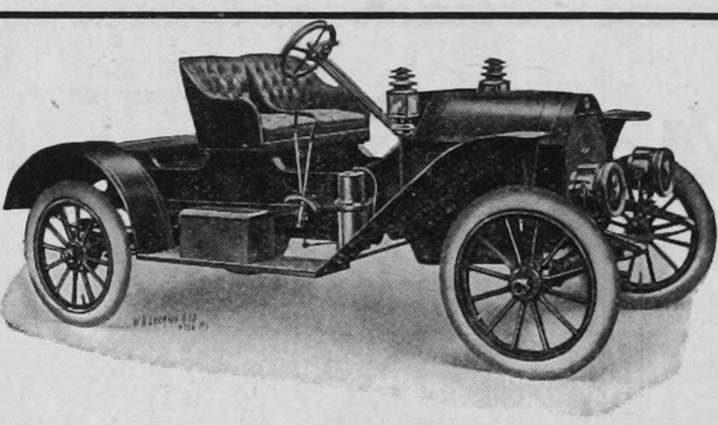
Taximeter

VACANT
EVER READY
TAXIMETER
PATENT PENDING
EXTRAS
DOLLARS CENTS
FARE
DOLLARS CENTS
AUTO IMPROVEMENT CO.
NEW YORK

It is just what he has been waiting for. Without a single fault and with twice as many important features, it stands prominently superior to other meters.

Illustrated Descriptive
Catalog Now Ready

AUTO IMPROVEMENT CO.
304-322 Hudson Street
NEW YORK
755 Folsom St., San Francisco



Four cyl., 24 H. P., 1300 lbs., $950

AIR-COOLED

Cameron Fours

5 MODELS — $950-$1100

Are faster, more powerful and more economical than any medium-priced water-cooled fours on the market. They will be on the road giving good service years after some of the present water coolers have been forgotten.

CAMERON AIR-COOLED MOTORS are more efficient under any conceivable condition than water-cooled motors of the same size.

CAMERON DIRECT DRIVE three-speed transmission is superior in every way to any other system now in use.

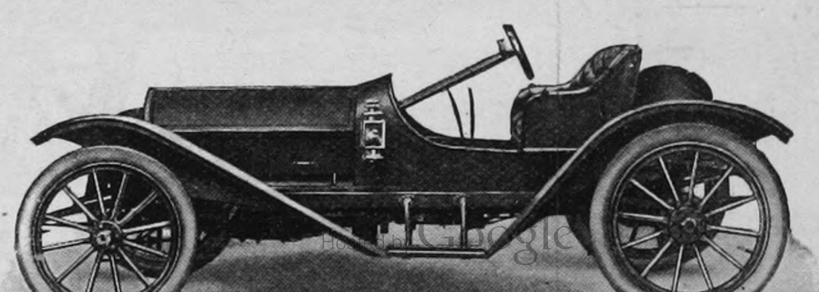
CAMERON WEIGHTS, in proportion to power, beat the world and defy comparison.

AIR-COOLED

Cameron Sixes

4 MODELS—$1500

Will hold their own with any stock car on earth, and their cost to operate is a mere fraction of that of cars near their



BRAKE

Thermoid

You Never Saw a Brake Once Lined With **THERMOID** Which Had to be Relined

Manufactured Only by **THERMOID RUBBER CO.**, Trenton, N. J.

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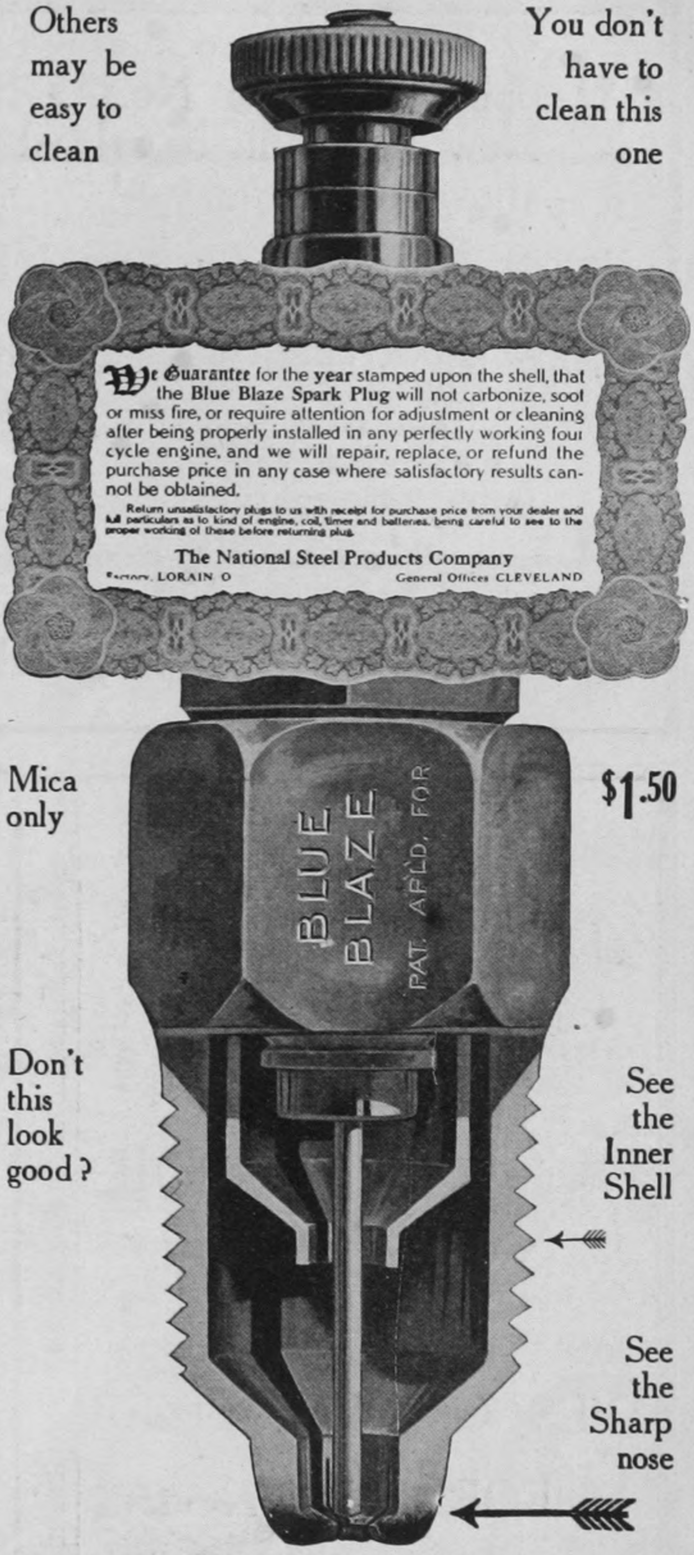
taken from your cylinder for the entire year

Others may be easy to clean

You don't have to clean this one



We Guarantee for the **year** stamped upon the shell, that the **Blue Blaze Spark Plug** will not carbonize, soot or miss fire, or require attention for adjustment or cleaning after being properly installed in any perfectly working four cycle engine, and we will repair, replace, or refund the purchase price in any case where satisfactory results cannot be obtained.

Return unsatisfactory plugs to us with receipt for purchase price from your dealer and full particulars as to kind of engine, coil, timer and batteries, being careful to see to the proper working of these before returning plug.

The National Steel Products Company

Factory, LORAIN O General Offices CLEVELAND

Mica only

$1.50

Don't this look good?

See the Inner Shell

See the Sharp nose

Send for Catalog of IGNITION GOODS

Bankrupt Sale

¶ The entire stock of The Kelsey Co., formerly doing business at No. 45 Niagara Street, Buffalo, New York, will be sold at Public Auction, at the above address on

November 10, '09, at 10 A. M.

¶ Stock consists of automobile and bicycle parts, fittings and sundries, appraised at about $15,000. The undersigned will be pleased to furnish detailed information.

JOHN J. HENRY, Trustee,

407 White Building
BUFFALO, N. Y.

WOOL
FELT

DUST AND OIL
WASHERS

DIES OF ALL SIZES
FOR CUTTING

TINGUE BROWN & CO.

64 Reade St., New York City

Are you paying too much for

Crucible Steel Castings?

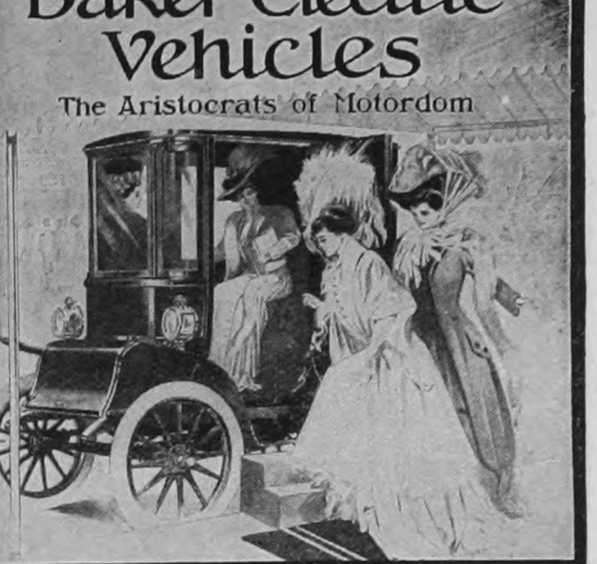
One of the ways to ascertain is to write us for prices.

Our castings, quality considered, are without competition. **Why?** We have the facilities. We can also satisfy you on deliveries.

VANADIUM
Steel Castings a Specialty

Keystone Steel Castings Co.

CHESTER, PA.



More Baker Electrics are sold each year than of all other makes

THE BAKER gives more mileage, more service and greater efficiency, with less trouble and less expense, than any other electric.

BAKER AGENTS have a monopoly of the best patronage in their locality.

They have more to offer their customers than dealers handling other electrics — they have no competition.

When you sell a BAKER ELECTRIC, you sell a car that performs what others "claim"— you sell a car which for years has been THE WORLD'S STANDARD.

The Baker is the car by which all electrics are judged — a car that is built for continuous service — not for "stunts."

A silent performer for every day in the year — a car built by experts in the largest and most up-to-date factory in the world, devoted exclusively to the building of electric automobiles.

The Baker Agency

If we are not represented in your city, WRITE US AT ONCE. Our new 1910 models include Coupes, Runabouts, Victorias, Broughams, Roadsters, etc.

EXHIBITED AT ATLANTA SHOW

Baker Motor Vehicle Co.

The simplest,
surest, most
serviceable
ignition
system
known

Used o
highest-po
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quality m
cars i
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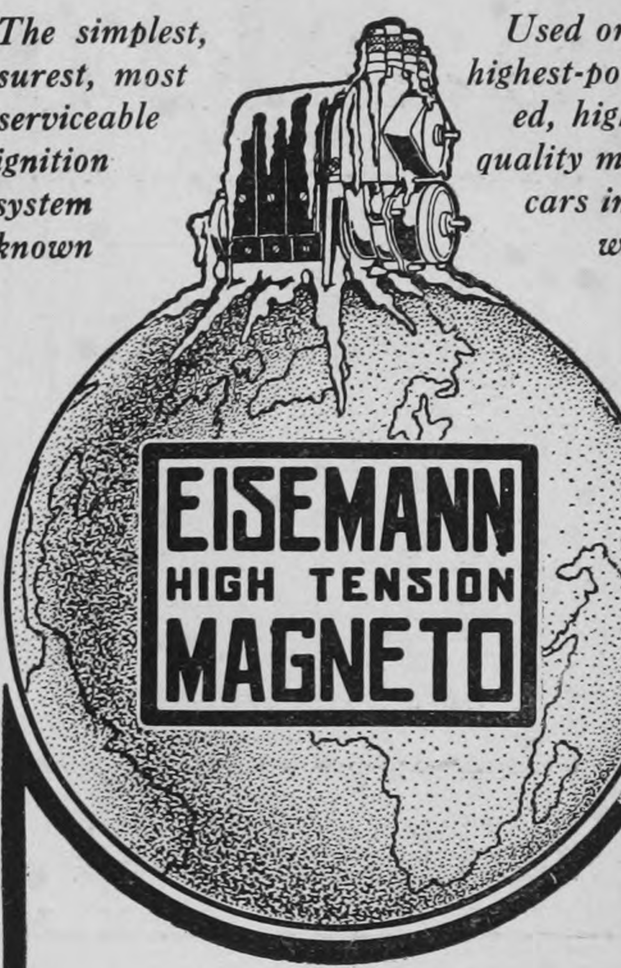


There may be Some Doubt

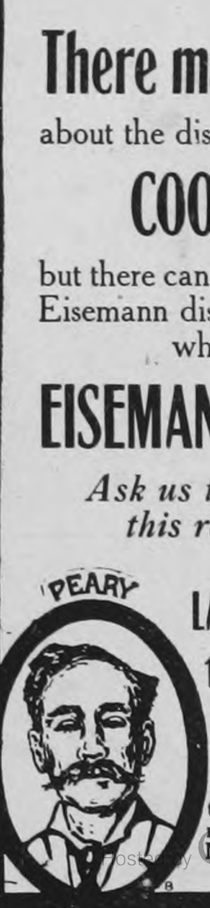
about the discovery of the North Pole by

COOK and PEARY

but there can be no doubt whatsoever that Eisemann discovered the Magnetic Pole when he invented the

EISEMANN HIGH TENSION MAGNETO

Ask us to tell you more about this remarkable magneto



LAVALETTE & CO.
112-114 W. 42d St.
NEW YORK

We will exhibit at the Atlanta Automobile Show, Nov. 6 13, 1909.

McIntyre

30 horse-power, 112-inch wheel base

$1250

36x3½-inch pneumatic tires. Splitdorf magneto, shaft drive, selective sliding gear transmission

W. H. McINTYRE COMPANY

Auburn, Ind.

Standard Mfrs. A. M. C. M. A.

1730 Grand Avenue
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AVOID
COLLISIONS

Are you risking your life with a brake lining which makes it impossible to stop car promptly?

Tests show that NON-BURN BRAKE BAND LINING is the only one of the five most largely used that will *lock wheels of an automobile instantly.* Many commonly used brake linings will not lock wheels in less than 25 feet.

NON-BURN BRAKE LINING

always wears longer than organic linings, because heat cannot char or burn it—water or oil cannot injure it. NON-BURN is made of *Asbestos* with fine brass wires in each strand—that's why it is practically indestructible.

Made to fit any brake or any friction or transmission clutch.

Write nearest branch for Sample and Booklet.

H. W. JOHNS-MANVILLE CO.

Baltimore	Dallas	Milwaukee	Pittsburg
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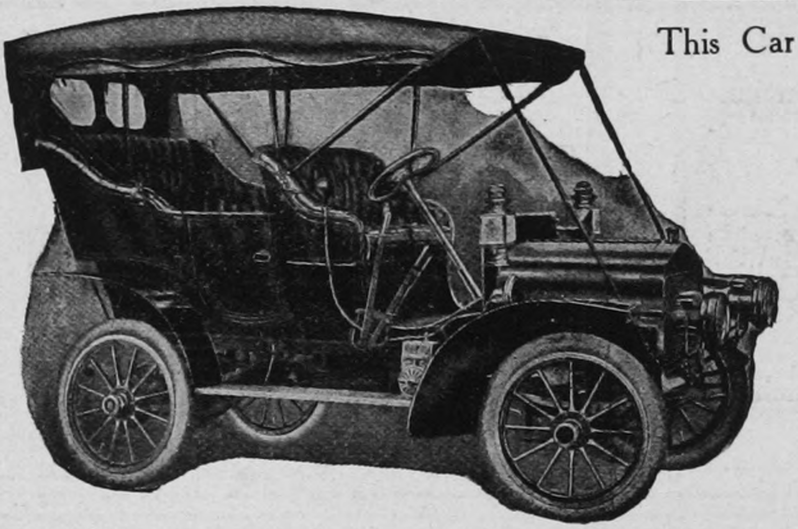

This Car Assembled Complete with T
Lamps, Wind Shield

$700

Prompt Shipment.

23 H. P. Motor, Shaft Dr

AUTO PARTS CO

52 & 54 W. Jackson Boulev

CHICAGO, ILL.

Overland

Capacity:
24 Hours a Day

Overland Cars spend more time in ac service every day than any kind of car existence. This is partly due to their munity from motor troubles.

But it is also due to the fact that anyb in the family can safely drive the Over —it quickly becomes an all around venience for the whole household.

The Overland owner and his family do motoring daily and for a longer service period any others. The Overland goes farther at les pense than other motor cars. It is less severe on less wasteful of power.

WESTEN
NEWARK.N.J

Two Friction Planes

Two friction planes in your shock absorber make a difference. One—the smaller—stops the disagreeable and damaging vibration of the hicle-body and prevents the crystallization springs. The other checks the excessive bound, eliminates the bounce and makes the dy ride easy. Both reduce the cost of upep.

Westen shock absorbers are the only absorb- that automatically adjust themselves to y load or road conditions and are self-lubriting. They offer different degrees of resistce to the action of the vehicle springs under rying conditions. Once attached, no adjustents necessary. Ask your dealer or send rect for interesting booklet.

VESTEN SHOCK ABSORBER

he Only Two Friction Plane

ESTEN MANUFACTURING CO.
HALSEY STREET, NEWARK, N. J.

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Are Money-Makers for
Automobile Dealers

SEND for SPECIMEN SHEET NO. 101

CHILTON PRINTING CO.
Market & 49th Streets, Philadelphia

RUBBER GOGGLES

IN LARGE VARIETY

Cover Rubber Goggles

Patented July 30th, 1907
June 16th, 1908
March 2d, 1909

Beware of Rubber Goggles not protected by COVER patents

New Catalogue upon application to any jobber.

SUSSFELD, LORSCH & COMPANY
37 and 39 MAIDEN LANE, NEW YORK

K & W RELINERS are so successful that Tire Experts believe we have solved the TIRE PROBLEM.

Milwaukee, Wis., Aug. 16, 1909.

Gentlemen:---Enclosed please find order for fifty of your Reliners. Within the past three months we have used about three dozen of these Reliners, and up to date they have given excellent service. We have not received one complaint in this course of time.

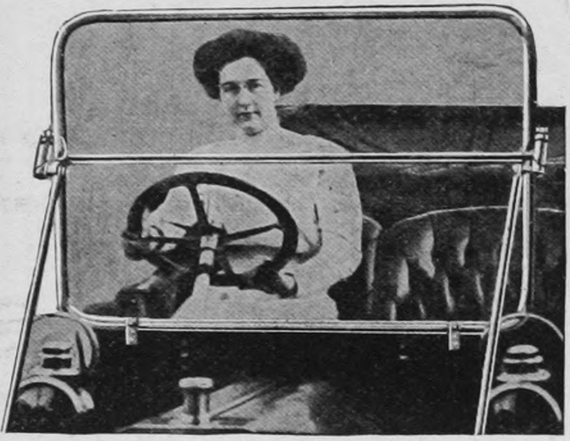
Yours truly,

Without filing or fitting
Milled

with a simple attachment operated on a common drill press by anyone wh can drill a hole. Every keyseat is exactly alike, and is made so without mea uring or fitting—an enormous advantage where exact duplicates are require The simplicity, cheapness and effectiveness of the National Keyseat Mill make it indispensable to every machine shop, large or small. 3,000 in u in the United States.

Write for Booklet and satisfy yourself

National Machine Tool Company
212 Lawrence St., Cincinnati, Ohio



AUTO-AUTOMATIC WINDSHIELDS

Are designed and manufactured as a strictly high-grade equipment for high-grade cars. Both Straight and Zig Zag Shields are automatic; operate smoothly and easily with one hand, and lock positively in both upright and folded positions. Guaranteed not to rattle or wear loose at any point.
Our Automatic Tilting shield for Roadsters and large Touring Cars is the handsomest job that has ever been manufactured.

Write for discount to the trade, or order sample shield fo your demonstrating car.

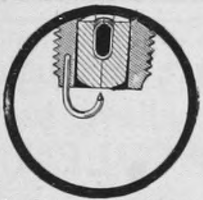
Auto-Automatic Windshield Co.
872 Woodward Avenue **Detroit, Michiga**

Two Reasons

Why you should use Reliance Spark Plugs
(REG. U.S. PAT. OFF.)

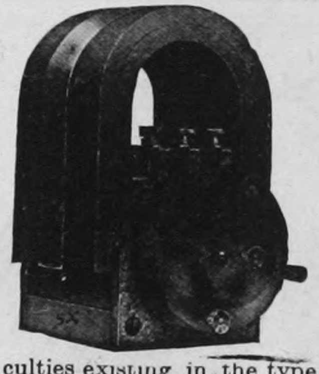
Reliance
SPARK PLUGS
SPARK IN WATER

"**Spark in Water,**" which means they will spark in the cylinder under any and all conditions, for water is the worst of all short-circuiting matter. A drop of water will short-circuit other plugs, which proves they are inferior. Reliance is the one plug that is **recognized** as mechanically correct.



The "**Sparking Point**" is a hair-like platinum wire, baked into the porcelain insulator and being so small that the spark is concentrated and intensified to such a degree that the heat and scouring action of the spark remove all fouling matter around that point. Soot accumulates on other plugs and necessitates **cleaning.** Cleaning entirely unnecessary with the Reliance Plug.

JEFFERY-DEWITT CO.
SPARK PLUG MANUFACTURERS
216 HIGH STREET, NEWARK, N. J.

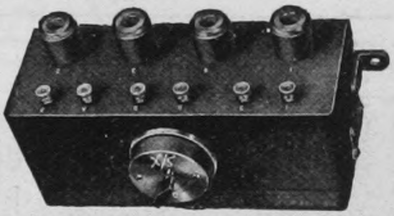


SX Magneto

The latest inventio of a well-known ignition expert.

Especially designe to overcome the difficulties existing in the type of machine heretofo on the market.

Simplicity is the "keynote" backed up by efficiency



No half tim gears or shaft

No Distributor.

No lag.

Not affecte by moisture.

Same coil for batteries and magneto.

The advantage of a dual system with the equipment of a single ignition system.

You will be interested in a full description.

If you want to know more about it, tell us "t show you."

The Lutz-Lockwood Mfg. Company

Punctures repaired anywhere—any time—any place. For M. & M. is instantaneous—positive and self-vulcanizing.

It's reliable too, and you need not be an expert to use it.

THE SUPERIORITY OF M. & M. CEMENT HAS MADE IT THE STANDARDIZED BRAND

—the brand which all automobilists, who want the best, insist upon.

Write direct for literature describing this wonderful preparation.

Your dealer handles M. & M.

Manufactured by

The M. & M. Mfg. Co., **Akron, Ohio**

V V V

Valentine's Vanadium Varnishes

Developed for the needs of the Automobile, its Manufacturers and its Users.
Write to the nearest office for a descriptive price list of Vanadium Varnishes.

ver 80% of all the Exhibitors at the Automo-
ile Shows of the last four years finished with

VA LE N TIN ES
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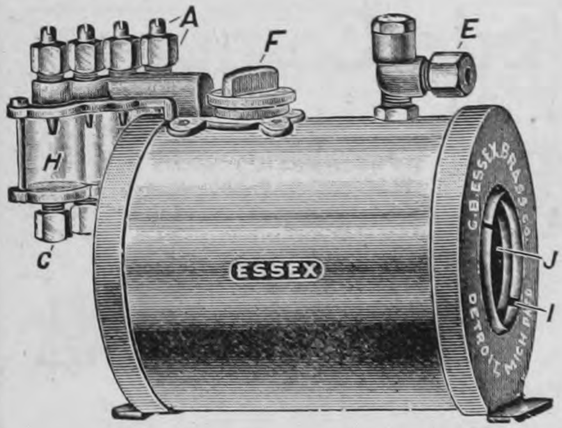
Valentine & Company

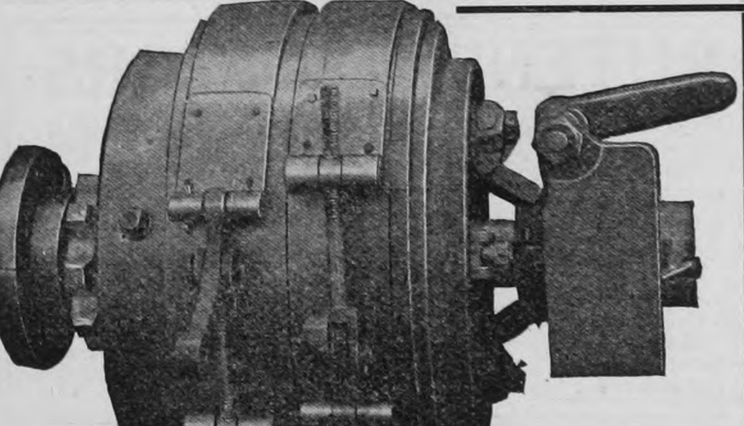
EW YORK CHICAGO BOSTON TORONTO LONDON AMSTERDAM PARIS



Automatic

Lubrication is the only successful method of lubricating **Automobiles. Always ready** and never gets out of **order. 75,000** in use.

G. B. ESSEX BRASS CO.
DETROIT, MICH.



TRANSMISSIONS
AND
Horizontal Motors

ANDERSON MOTOR CO.
16th & Jackson Streets

"The Best for YOUR Engine"

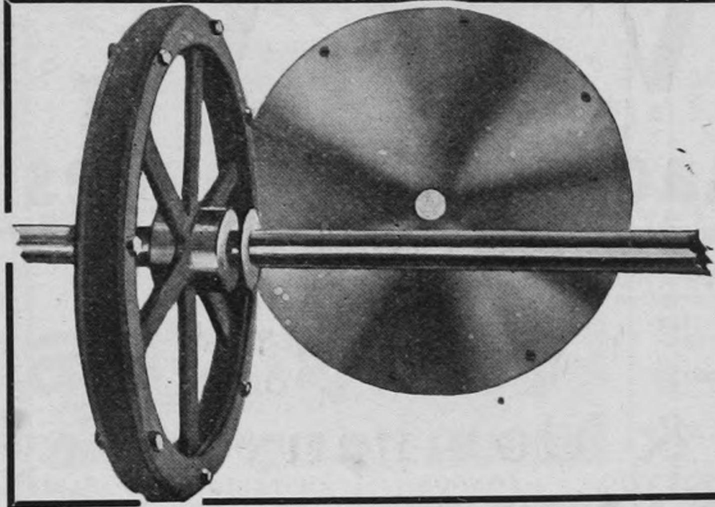
a little lubrication once or twice a year might do. Unfortunately it is not, and pure oil, with plenty of it, is essential to its successful operation. *Demand*

MONOGRAM OIL

Manufactured Solely by

The Columbia Lubricants Co. of N. Y., 116 Broad St., N. Y. City

MONOGRAM OIL is sold at all garages



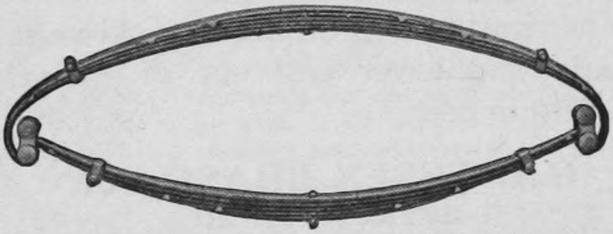
The Climax Friction Transmissions are driving more cars than all others combined. There's a reason. Our free books will tell you why and save you money. Don't buy until you ask for it.

CLIMAX ELECTRIC WORKS
NEW SALEM, MASS.

Liggett Spring & Axle Company

PITTSBURG, PA.

Automobile Springs of Quality

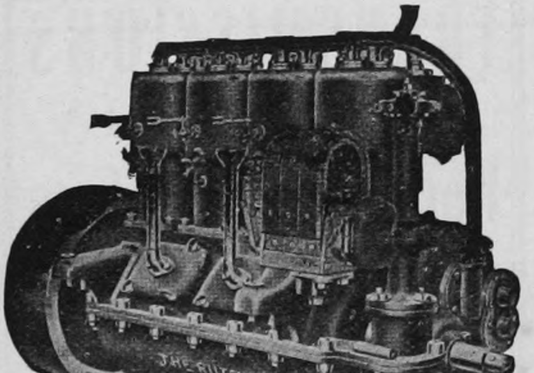


CARBON STEEL
CRUCIBLE STEEL
VANADIUM STEEL

ALL SCIENTIFICALLY TREATED

Every Spring is positively guaranteed.

We know how springs should be made and make them that way.



RUTENBER MOTORS

since the early days of the automobile have won and maintained a premier position solely through merit.

Do you think you will make any mistake equipping your cars with **RUTENBERS?** Ask the leading manufacturers.

We manufacture the following models:

4 cylinder, 4 x 4, 25-28 H. P.
4 cylinder, 4½ x 5, 30-35 H. P.
4 cylinder, 4¾ x 5, 40-45 H. P.
6 cylinder, 4½ x 5, 50 H. P.

Each model equipped for magneto attachment, and all except the 6 cylinder fitted with oil-pan base. Now booking orders for last half of 1910. First come first served.

Mr. Bernhart says— that the Jewel car which went through the 2600-mile Glidden tour had "Perfect Ignition." He uses

Sta-Rite
Spark Plugs

Get a set right away. They are "Guaranteed Perpetually," because they stay right longer than any other plugs.

Half-Inch Separable
Price, $1.25
Patented Oct. 22, 1907

The R. E. Hardy Co.
(Inc. 1900)
Factory
201 37th St., Brooklyn
New York
309 Fisher Bldg.
Chicago, Ill.

PLATINUM IRIDIUM POINTS

FLASH LIGHT

Platinum Iridium Points
$1.50
THE ONLY PLUG FOR MAGNETO
Janney, Steinmetz & Co.
PHILADELPHIA

CENTURY SINGLE PHASE MOTORS

Are self starting under full load, and are automatic in operation. They are adapted to the operation of any apparatus requiring a constant speed, and particularly the operation of Pumps, Air Compressors and Generators for Charging Storage Batteries.

We build in standard horizontal, vertical and back geared types, ¼ H. P. to 30 H. P. for any commercial frequency and voltage.

CENTURY ELECTRIC CO., MAIN OFFICE AND WORKS: 19th & Olive Sts., St. Louis, Mo.
New York Office:—30 Church Street

Sommer Motor Company
AURORA, ILLINOIS

Manufacturers of High-Grade **Gasoline Motors**

Two and Four Cylinder. Water and Air Cooled

The Vickers, Light 20-24 $650.00

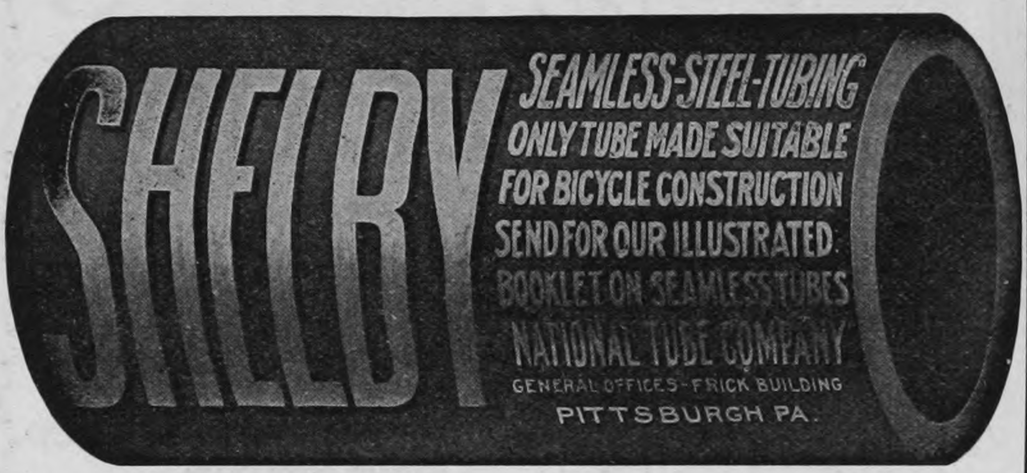
Strong and Speedy—Yet Light and Graceful

SPECIFICATIONS

Motor—4 cylinder, 2-cycle.
Transmission — Sliding Gear on Rear Axle.
Bearings—Annular throughout.
Wheel Base—96 inches.
Weight—850 pounds.
Special features upon application.

Write for the Introductory Offer for THE QUIET QUALITY CAR

The Vickers Motor Car Co., Coshocton, Ohio



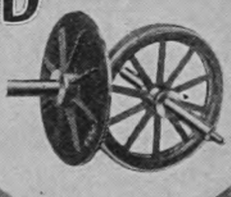
SHELBY
SEAMLESS-STEEL-TUBING
ONLY TUBE MADE SUITABLE FOR BICYCLE CONSTRUCTION
SEND FOR OUR ILLUSTRATED BOOKLET ON SEAMLESS TUBES
NATIONAL TUBE COMPANY
GENERAL OFFICES-FRICK BUILDING
PITTSBURGH PA.

For the convenience of customers desiring immediate delivery, stocks of Shelby Seamless Steel Tubing are kept in many large cities; the location of stock nearest to any specific point will be advised on request.

District Sales Offices

ATLANTA
CHICAGO
DENVER
NEW ORLEANS
NEW YORK
PHILADELPHIA
PITTSBURGH
PORTLAND
SAN FRANCISCO
ST. LOUIS
SALT LAKE CITY
SEATTLE

ROCKWOOD Paper Frictions



Friction Drives

are rapidly increasing in popularity. Give increased power efficiency and unlimited speed flexibility. Noiseless, light, economical and very simple. No gears to strip or burr.

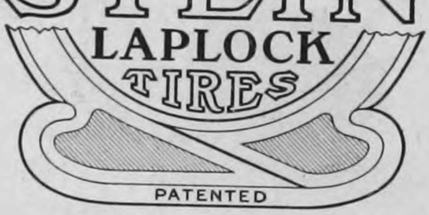
Rockwood Paper Frictions make the ideal friction drive. Our booklet, **"Friction Transmission,"** an engineering treatise devoted to this subject, contains formulae and other data for the designer.

Sent free on request.

State occupation and firm connected with.

The Rockwood Mfg. Co.

All Alike but STEIN



The Country will soon know why the STEIN LAP-LOCK TIRE is different from all others.

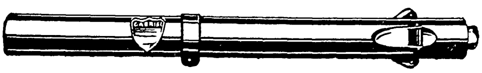
Our big magazine campaign starts soon. It will create a big demand that you should be prepared for. Write us for jobbing and retail proposition. It's an unusual opportunity for you.

Send for Booklet "R"

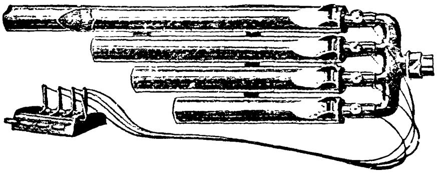
1910
GABRIEL
GABRIEL HORN MFG. CO
CLEVELAND
1910

The 1910 Gabriel Accessories

The Gabriel Horn



Our 1910 model is the same as our No. 2, 3 and 4 horns except that the two lower notes will be operated together, making a perfect chord, while the high note, which is two octaves higher than the bass chord, gives the effect of a soprano voice with a quartette. This change in combination produces a singularly sweet musical effect and gives greater carrying power than any signal made.



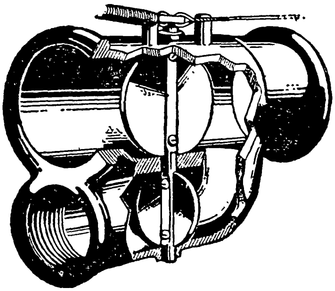
Trumpet Horn

Consists of four single tubes which can be operated individually from keyboard, thus making many combinations of bugle and trumpet calls, or all four tones may be operated in unison for signal purposes. This horn has become very popular with clubs and cliques which have their own code of calls.

Special Ten Tube Horn

(Built to order)

This is the horn which created such a sensation in New York and other cities when it was first brought out. Has full octave in key of G with F sharp and A. It is operated by a keyboard and all sorts of melodies can be played on it. The music from this instrument is indescribably sweet and affords pleasure not only to the occupants of the car but the general public as well.



1910 Valve

Our new valve is like the 1909 model, except that the lever is made from ⅜-inch material and the construction changed so it practically forms one piece in strength clear through the valve. Made in sizes ¾ inch to 3 inches for steel tubing and from 1 inch to 2 inches in iron pipe sizes. The valve can be used for cut-out purposes by removing disc in main channel.

Agents Wanted Everywhere. Write for Booklet

GABRIEL HORN MANUFACTURING COMPANY

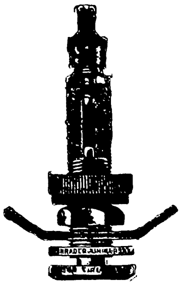
1412 E. 40th Street, Cleveland, Ohio **New York Branch, 1926 Broadway**

ESTABLISHED 1844

Schrader Universal Valves

Trade Mark Registered April 30, 1895

SIMPLE AND ABSOLUTELY AIR TIGHT



(Half Size)

Schrader Motor Tire Valves, as shown in cut, are the regular equipment for G & J style Motor Tires, whether used on ordinary rims or demountable rims, such as Michelin or Continental Ready-Flated Tires, and are also used on Hartford Detachable, Fisk Detachable and New Goodyear Detachable Motor Tires.

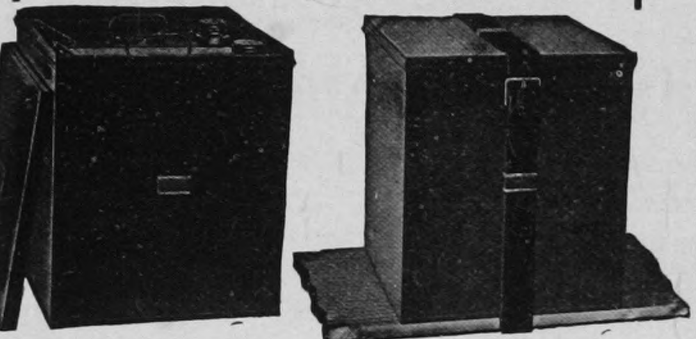
Our No. 777 Motor Tire Valve is the standard for 2½" and 3" tires, and our No. 725 Motor Tire Valve is the standard for tires larger than 3".

Schrader Universal Valves as shown in cut and in different modifications, are used on all Bicycle tires made in this country. These Valves are supplied to the trade by all Tire Manufacturers. Valve Parts can be obtained from the Tire Makers or from the Manufacturer.

SCHRADER UNIVERSAL VALVE

A. SCHRADER'S SON, Inc., 28-30-32 Rose St., New York City, N. Y.

THE NEW DOVER TOURIST OIL AND GASOLINE KIT



Opened Attached to Running Board

A neat, compact and dust-proof device for carrying extra oil and gasoline when touring.

The Tourist Oil and Gasoline Kit

consists of a fine, black enamel steel case containing two special enameled cans, having a capacity of over 1½ gallons EACH, with special pouring spout and filler cap.

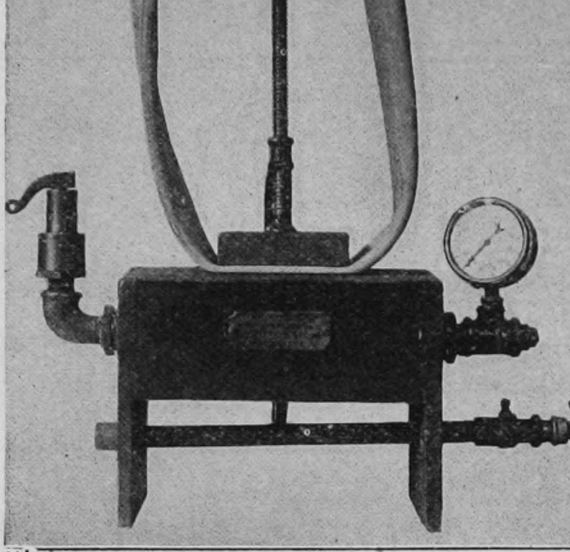
INSTANTLY ATTACHED AND DETACHED

Price, complete with strap, $3.50

Correspondence Solicited.

DOVER STAMPING & MANUFACTURING COMPANY

CAMBRIDGE, MASS.



SOMETHING NEW

Steam Vulcanizer for garage and private use. Very cheap and easy to operate; will cure three tubes at a heat. Will not burn tube while being cured. Complete outfit consisting of rubber, backing, stitcher, shears, cement and clamp. For information write.

KERR-GRIFFIN VULCANIZER CO
5919 Penn Ave., Pittsburgh, Pa

Agents Wanted

Oberdorfer Type "B" Pumps for Gray Motor Co.

5,000 for 1909
7,500 for 1910
═NUF SED═
WRITE FOR CATALOG

M. L. Oberdorfer Brass Company, Syracuse, N. Y.

Invader Oil
for Automobiles
Chas F Kellom & Co

INVADER OIL

INVADER CYLINDER OIL (the Pioneer light oil) positively eliminates the many undesirable features so common with ordinary oil. Give **Invader Oil** a fair trial—your motor will show its appreciation. "Be sure it's **INVADER,** then go ahead."

You name the car, we'll name the grade.

INVADER GEAR OIL is the crowning triumph of 28 years' experience in the lubricating field. It is of superior quality, scientifically manufactured, and is the ideal lubricant for **transmission** and **differential** gears.

Its use insures longer life to your gears and reduces friction to a minimum.

For Sale by Reputable Dealers, Garages and Supply Houses

CHICAGO AGENTS

Invader Gear Oil
For Packard Timing Gears
Invader Gear Oil
Chas F Kellom & Co

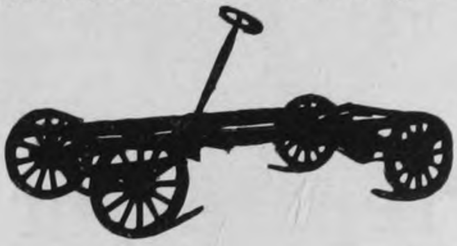
DO YOU KNOW

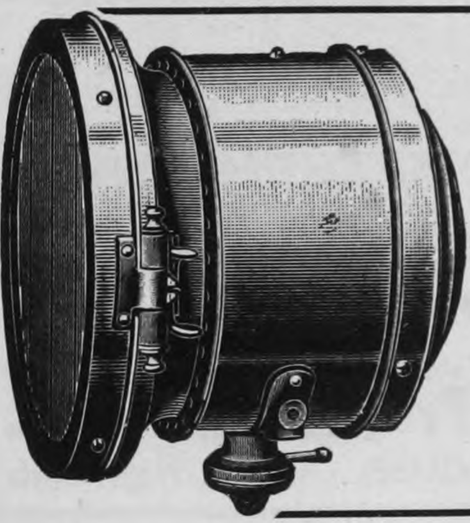
That we make pressed steel or angle iron frame gears, with chain or shaft drive, any height of wheels, and any wheel base up to 138 inch ?

Our Prices will Interest You

We also make bodies, wheels, axles, steering devices and cars ready for power.

BORBEIN AUTO CO., 2109-11 N. 9th St.,
ST. LOUIS, MO.





Your dealer can afford to give you the BEST Headlight; insist on having it.

The ATLAS

with its superior ventilation and patent spring catch for the door, is the best Lamp made in the World. Take no other.

NEW YORK AUTO LAMP COMPANY
68 Clarkon Street, New York

The *"Long-Arm" Products* appeal to those who want the best workmanship and material. That is why we number many of the leading Car Builders among our customers.

We produce, in quantity,

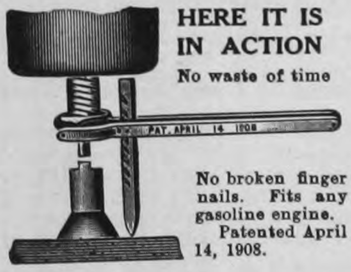
AXLES (Front and Rear).

TRANSMISSIONS, CONE CLUTCHES,

STEERING COLUMNS, etc.

THE "LONG-ARM" SYSTEM COMPANY, - Cleveland, Ohio

Triumph Valve Remover



HERE IT IS IN ACTION
No waste of time

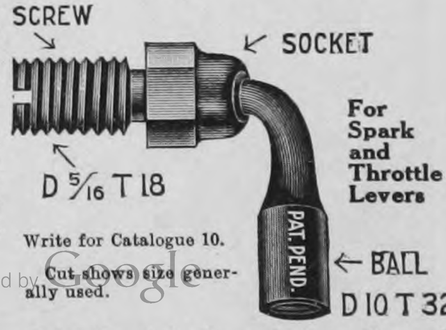
No broken finger nails. Fits any gasoline engine. Patented April 14, 1908.

Enables you to remove valve key or valve spring with no side strain or bending of valve stem. List price, $1.00. Discounts to manufacturers, jobbers and dealers. If your dealer cannot supply you, send us P. O. order for $1.00 and the Remover will be sent you postpaid.

We also manufacture **Grease Cups** and other Gas Engine Specialties, Screw Machine and Punch Press

Adjustable and Non-Adjustable Ball Joints

for connecting carburetor and timer with levers on wheel steer, eliminating all lost motion and giving a more perfect control to these levers at all times. Easily and perfectly adjustable.



For Spark and Throttle Levers

Write for Catalogue 10.

Cut shows size generally used.

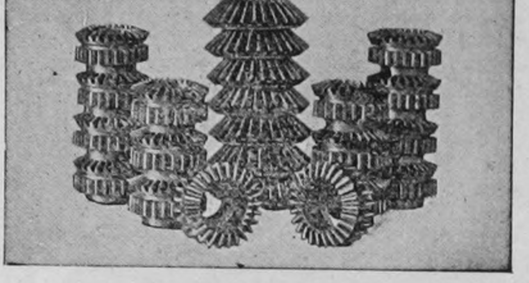
Hayes Wheel ayes Wheel Co.

WHEELS

¶ We are the oldest Auto Wheel Builders in the country, and, having all new improved Auto Wheel Machinery, we are able to produce the most perfect wheel on the market. Kindly allow us to send you a sample set and also to explain our methods.

HAYES WHEEL COMPANY, JACKSON, MICHIGAN

American Distributing Company, Sales Agent
INDIANAPOLIS, INDIANA

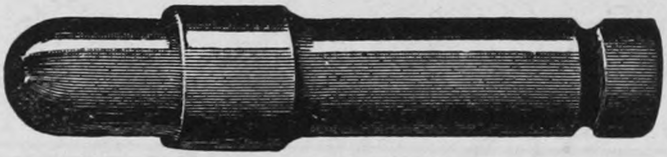


Prepare For 1911

We are now closing contracts for gears for 1911 delivery. Manufacturers who had trouble securing the quantity of gears required for 1910 will see the wisdom of covering early on at least a part of their probable requirements.

THE
New Process Raw Hide Co.
SYRACUSE, - - New York

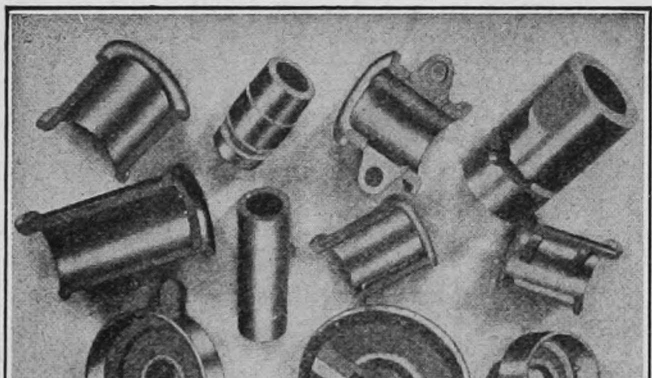
IMPERIAL PORCELAIN SPARKING TUBES



MANUFACTURED BY

The Imperial Porcelain Works, Trenton, N. J.

When desiring quotations always send sample or drawing of style required.



Finished Metal Castings of Superior Tensile Strength from Superior Alloys

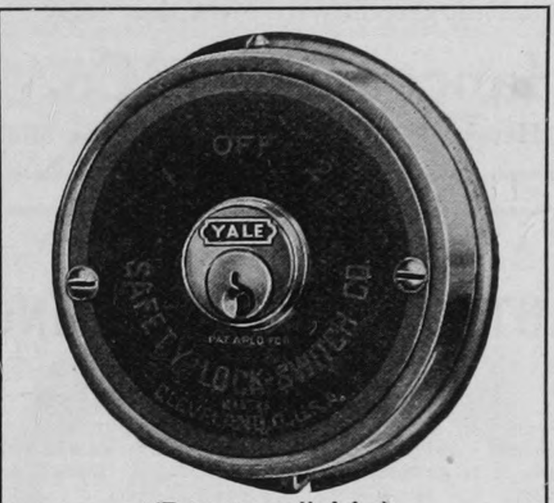
Thirty Years' Experience in Compounding Alloy

Finished Die Moulded Bearing Bushings for Gasoline Engines our Specialty; also Timer Parts—in fact everything that you are now using cast from brass. Our Die Castings need no filing, fitting or machining but are ready for assembly when leaving our factory. Manufactured by our new and improved vacuum process.

E.B. VanWagner Mfg. Company

Safety Lock-Switch

for gasoline cars offers to automobile owners absolute protection from theft, tampering and unauthorized use. The lock cylinder itself operates the switch and the key takes the place of the plug.

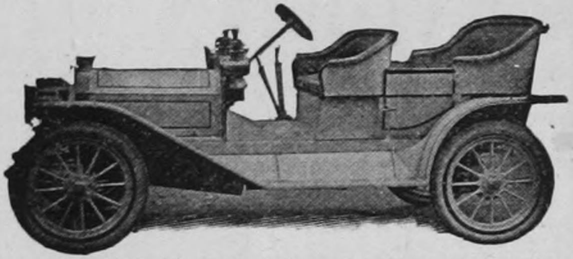


(Patents applied for)

The Britton & Carleton Mfg. Co.

Also Makers of the Safety Lock-Switch
for Electric Vehicles

311-312 Caxton Building, Cleveland, O.



Model H, Light Touring Car, Rutenber 25 H. P. Motor, Price, $1300
Continental 28 H. P. Motor, Price, $1350

¶ The dealer who is anxious to handle a reliable, dependable car will find what he wants in the CRAWFORD. Ample manufacturing facilities, combined with long experience enable us to give better value at a lower price, with the result that the CRAWFORD is a ready seller.

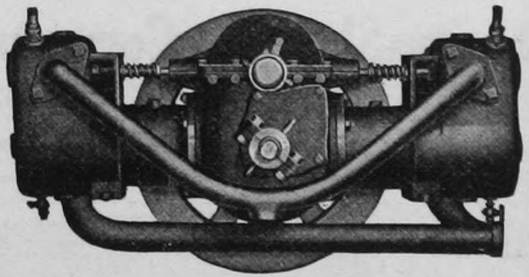
FOUR MODELS

Model	"F,"	50 H. P.,	7 passenger,	$3250
"	"D,"	25 H. P.,	Runabout,	1250
"	"H,"	25 H. P.,	Light Touring Car,	1300
"	"G,"	40 H. P.,	Touring Car,	3000

CRAWFORD AUTOMOBILE CO.
HAGERSTOWN, MD.

QUESTION: Which is the most powerful, simple and reliable Engine of the four-cycle type, adaptable for any car from a Runabout to the 2800-lb. Touring Car?

Ask Beilfuss



Air and Water Cooled

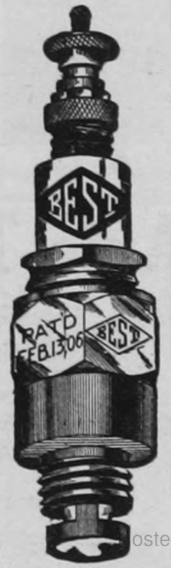
Air-cooled engine, 10-12 H. P.
Water-cooled, 10-12 and 18-20 H. P.

Give us information concerning your product and let us figure with you.

THE
BEST
TRADE MARK
SPARK PLUG

PATENTED

Patent Applied for, **MARCH, 1902**
(other patents allowed)
(other patents pending)



New York, 11–27, 1908.

Best Ignition Equipment Co.,
N. Y. C.

Gentlemen:

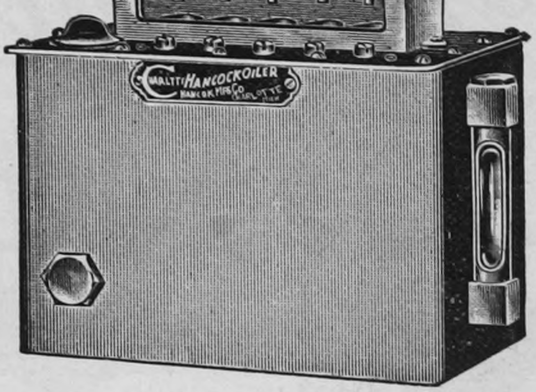
The set of "Best" Spark Plugs purchased for my 20-30 Renault car has given remarkable, reliable service and rendered me increased satisfaction by the true, sweet running qualities and increased power secured by their use

On a trip to New Haven I passed all 20 30 Renault cars on the steep hills. I now realize what is meant by sweet running, it is a sensation I never experienced before, although I have ridden in many cars. This quality is only made possible by the use of your "Best" Spark Plugs. They are surely the best.

I can recommend them to all owners of Renault cars.

Yours very truly,

HAROLD A. ROSENBAUM.



If You Are Looking

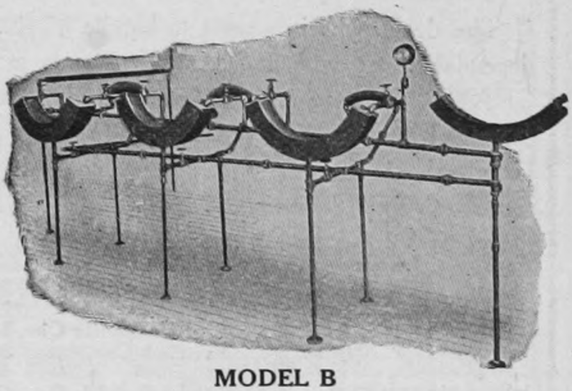
for a better lubricator than the Hancoc Valveless Oiler, you'd better stop you search.

Because you won't find it.

The catalog tells why—want a copy?

Hancock Mfg. Co.

776 E. Henry Street **Charlotte, Mic**



MODEL B

A New, Paying Business for a Small Investment

AUTO TIRE VULCANIZIN

with the

MARBLE-HAYWOOD PLANT

Our four models adaptable to all purposes. separate and independent business; vulcanizin dept. of a garage, or repair dept. of motor ca factory.

Model A, $250; B, $200; C, $150; D, $12

Every repair for every tire. Complete, compac indestructible. First cost is only cost.

Write for catalog and auto tire repairing by me who know.

M. E. HAYWOOD MFG. CO., 332 N. Illinois St. Indianapolis, Ind

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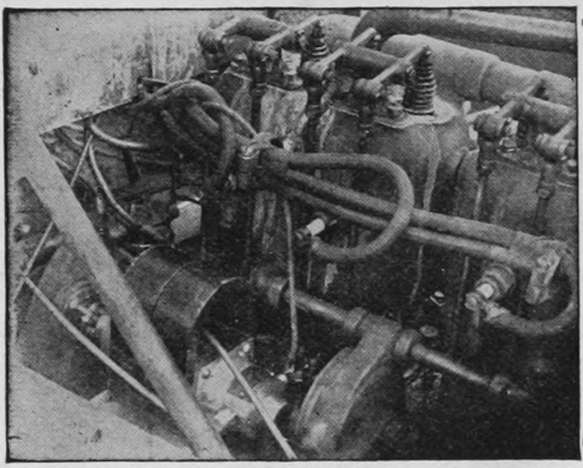


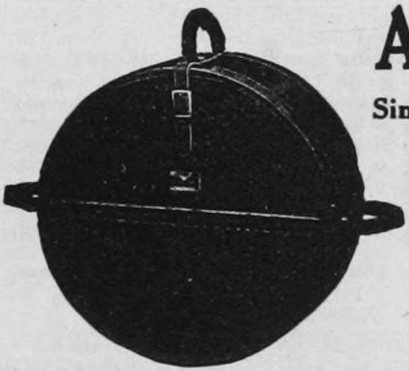
BRING your Buick model 1 runabout up to date anc improve its operation with ar M. & S. magneto. Full ball bear ing, absolutely guaranteed, anc

The Price is only $35.00

You can install it yourself.

Mavity-Sleeper Company

123 Fifth Street, Fowler, Indiana



Auto Trunks

Single, Double, Triple and with Inside Grips

Write for Special Catalog

Manufactured by

Raybestos

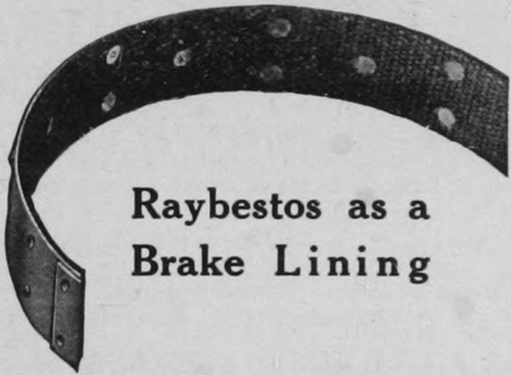
A PERFECT BRAKE LINING AND FRICTION FACING

RAYBESTOS is composed of asbestos woven with copper wire, produces greater friction than metal to metal, and positively will not carbonize.

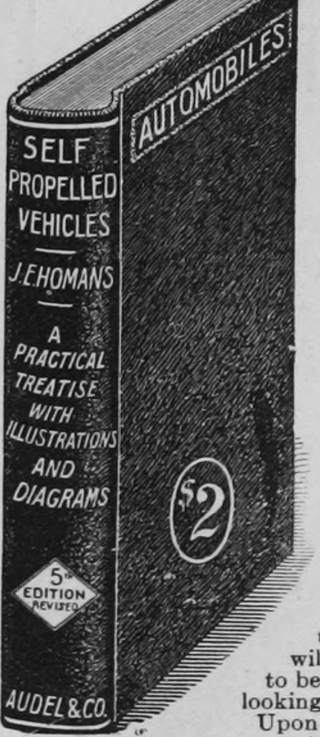
RAYBESTOS makes Brakes silent in action, enables them to "grip" instantly. This famous fabric is wear-proof—it will outlast the life of any other brake lining many times.

Write us to-day for particulars

ROYAL EQUIPMENT COMPANY
163 Housatonic Ave., Bridgeport, Conn.



Raybestos as a Brake Lining



pelled Vehicles" gives full details on successful care, handling and how to locate trouble.

Beginning at the first principles necessary to be known, and then forward to the principles used in every part of a Motor Car.

It is a thorough course in the Science of Automobiles, highly approved by manufacturers, owners, operators and repairmen. Contains over 400 illustrations and diagrams, making every detail clear, written in plain language. Handsomely bound.

Price $2, Postpaid

SPECIAL OFFER

The only way the practical merit of this MANUAL can be given is by an examination of the book itself, which we will submit for examination, to be paid for or returned, after looking it over.

Upon receipt of the following agreement, the book will be forwarded.

No money in advance required; sign and return

Theo. Audel & Co., 63 Fifth Ave., New York

Kindly mail me copy of HOMANS' AUTOMOBILES, and, if found satisfactory, I will immediately remit you $2.00, or return the book to you.

NAME ....

ADDRESS ....

Cycle

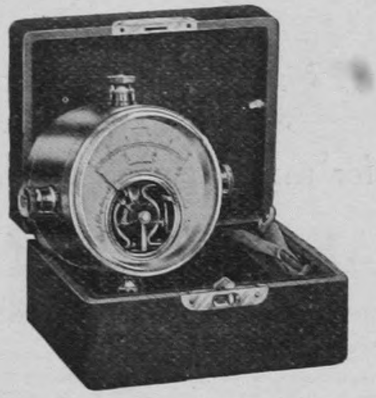
SEAMLESS TUBING

BRASS and COPPER

Prompt Delivery
Best Quality
Best Price

BUFFALO TUBE CO.

THERE is no refinement of motor design that can compensate for a faulty system of ignition, and there is no ignition equipment that will retain its highest efficiency unless the adjustments are made systematically and with precision.



The HOYT POCKET TRIUNE VOLTAMMETER

is the acme of meter development. Made on the D'Arsonval principle. It embodies three instruments in one; i.e., a Voltmeter reading to 10 volts, for testing storage batteries; an Ammeter reading to 30 amperes, for testing dry cells, and an Ammeter reading to 1½ amperes for testing coil vibrators. This latter will indicate a change of 1-50 of an ampere. The instrument is fully jeweled, and is contained in a plush-lined morocco case. Price, $12.00.

Our Bulletin T J will interest you. Sent FREE on request.

HOYT ELECTRICAL INSTRUMENT WORKS
Department T, PENACOOK, NEW HAMPSHIRE

The Silent Simplified MARINE ENGINE

NOISELESS
ECONOMICAL

FEWER PARTS THAN ANY FOUR-CYCLE ENGINE
BUILT IN SIZES SUITABLE FOR BOATS, FROM 25 TO 100 FEET
2-cylinder 10-15-25 H. P.
4-cylinder 20-30-50 H. P.
SEND FOR CATALOGUE

THE S. M. JONES COMPANY
620 Segur Avenue :: :: Toledo, O., U. S. A.

G & J
CLINCHER
G&J
Trade Mark
Look for it on the Tire

We Make G & J Tires

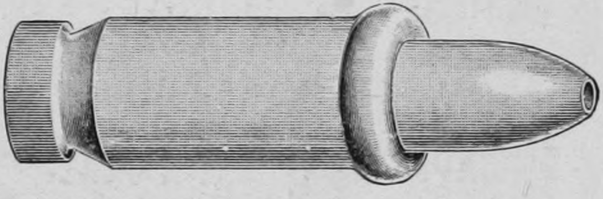
of a quality that can always be depende upon. They give the kind of service tha keeps a tire sold after it leaves the deal- er's hands. Automobile owners usin

G & J TIRES

have no occasion for complaints. The are always satisfied and good nature

G & J TIRE CO., :: INDIANAPOLI

If you are having trouble with PORCELAIN CORES



write us for samples and prices.

THE STAR PORCELAIN COMPANY, Trenton, N. J.

BISON SPARKERS
BISON STORAGE BATTERY CO.

BISON Sparkers

For Quality, Efficiency and Lif

Are in a Class by Themselves

TYPE	LENGTH	WIDTH	HEIGHT	VOLTS	AMP. HRS.	PRIC
I-56	6½	5⅝	8	6	40	$16.0
I-76	9	5⅝	8	6	60	$20.0

DEALERS WRITE FOR SPECIAL DISCOUNT

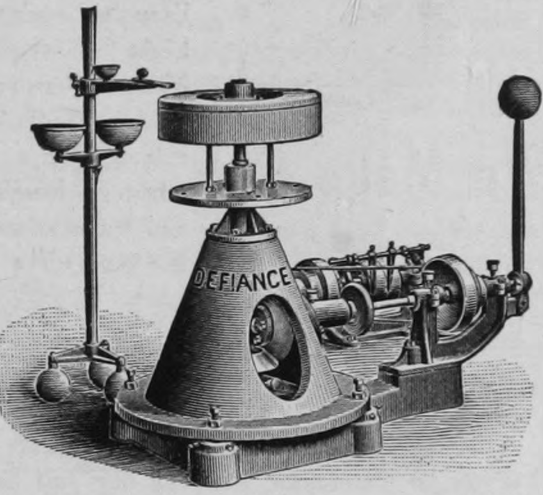
Bison Storage Battery Co. BUFFAL
New York

NEW YORK CITY BRANCH

AUTOMOBILE Owners and Drivers

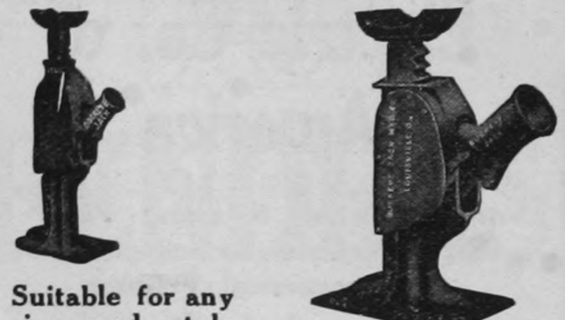
should insist on having the fly wheels on their engines in perfect running balance. It corrects the vibration and makes motoring more pleasant. This is the only machine on the market for this important work. It is used by the principal builders and is made by

THE DEFIANCE MACHINE WORKS, Defiance, Ohio



MOTOR FLY WHEEL BALANCER

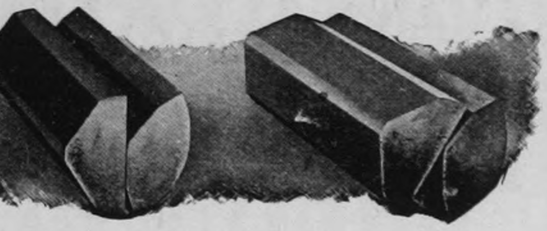
Buckeye Jacks
in all sizes



Suitable for any size and style Automobile made. For cars weighing from 500 to 8000 pounds. The largest variety of sizes made by any jack manufacturing company in America.

Style	Capacity	Height Bar Down	Raise of Bar	Height Bar Raised	Weight Pounds	Size of Base
No. 0	1 Ton	12″	6″	18″	9	3¾x5¾″
05	1 Ton	12″	6″	18″	9	3¾x5¾″
02	1 Ton	12″	6″	18″	8¾	3 x5⅛″
01	1 Ton	8¾″	5″	13¾″	8¼	3 x5⅛″
01	1 Ton	9¼″	5″	14¼″	8½	3¾x5¾″
03	1 Ton	10″	6″	16″	5	2⅝x4½″

THE BUCKEYE JACK MFG. CO.
LOUISVILLE, OHIO

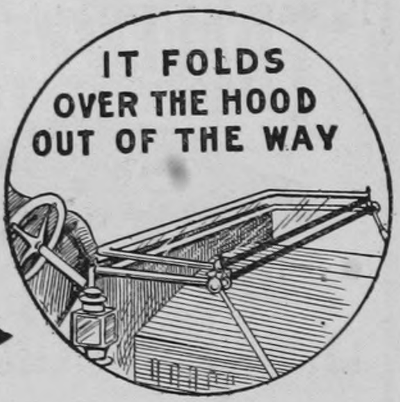


The Joints of The Morse Chain

Are composed of a two-part pintle, one rocking on the other, sliding friction being entirely eliminated, thus greatly reducing the wear on the joint.

Send for Catalogue No. 7

Easiest To Sell



We *Send* You *Customers*
FOR
"UNIVERSALS"
"The Aristocrat of Wind Shields"

Leaves the driver's vision *clear*, dividing bars being *below* the eye-line. Folds *flat* over the hood—*very* compact. Up in a *jiffy*—down *quicker*—all with *one* hand. Patent catches *prevent* breakage if folded too hurriedly. Sold under a *life-long, anti-rattle, perfect* construction guarantee.

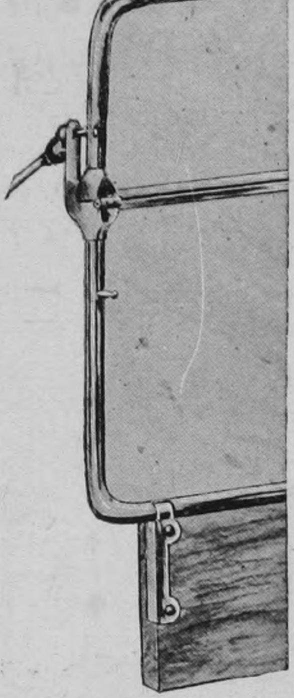
Our New Plan BRINGS You BUYERS.

The Elwell-Parker Electric Co. of America

Manufacturers of following Parts for Electric Vehicles, for both pleasure and commercial purposes:

- **Motors**
- **Controllers**
- **Front and Rear Axles**
- **Power Plants**
- **Complete Chassis, ready for body, tires and batteries**

Office, No. 4223 St. Clair Ave.
Works, 4300 Hamilton Ave.
CLEVELAND, OHIO



Sectional View

The
Self-Lockin
FOLDIN
WIND
SHIEL

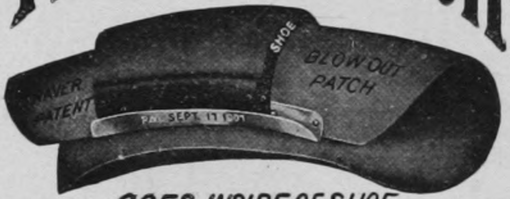
Easy to opera
Light in weig
Made of Brass a
Glass. No bo
nuts or clamps
adjust. Dura
and handsom
Reasonable
price.

MANUFACTURED BY

Metal Stamping C
30-50 Hubert St., New York

Write for Catalogue, showing our full l
of Automobile Specialties.

TRAVER BLOWOUT PATCH



GOES INSIDE OF SHOE

Made of FABRIC and Rubber, like an AUTO SHOE; with a brass flange that prevents it from "CREEPING."

YOU NEED NOT CARRY EXTRA SHOES if you carry Traver Patches.

THE ONLY road repair for a RIM CUT; THE BEST in the World for a BLOWOUT

DON'T THROW WORN SHOES AWAY Traver Patches Make Them Serviceable

A MONEY-SAVER for the OWNER
A TROUBLE-SAVER for the CHAUFFEUR

FOUR SIZES

No. 0—For shoes 2½ and 3 in.	$2.50
No. 1—For shoes 3½ in.	3.00
No. 2—For shoes 4 and 4½ in.	3.50
No. 3—For shoes 5 and 5½ in.	4.00

Three Styles: CLINCHER—DUNLOP—FISK State Size and Style required.

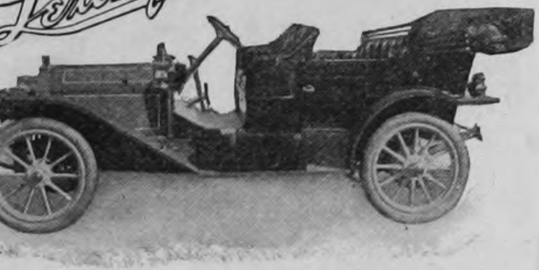
For Sale by All Dealers, or Sent Anywhere in the United States upon receipt of price.

COMMERCIA
POST CARD

In Natural Color

¶ Made to order to suit your requirements. Make good advertisements, at reasonable prices. Send us pieces of your printed matter, but ask for SAMPLES and PRICES.

Chiltonn Printing Compan



Model A—5 or 7-Passenger Touring Car

DON'T confuse the LEXINGTON with other cars on the market selling at the same price. It is not an aggregation of parts, bought at the vest quantity price on the open market, and priced y above its value. On the contrary, the list price s not agreed upon until after the car was built, king use of the best construction throughout. at's why the LEXINGTON is giving such unisally good service.

THREE MODELS:

uring Car Roadster Short Coupled Body

e want good agents. Send for our proposition.

ne Lexington Motor Car Co., Inc.
LEXINGTON, KY.

Make

FENDERS

and

Guarantee Delivery

Ask us about it

Metal Stamping Co.
Jackson, Mich.

SCHAFER BEARINGS

(MADE IN GERMANY)

BARTHEL & DALY

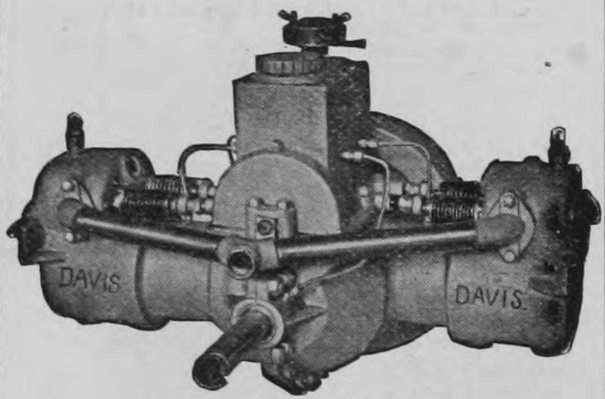
42 Broadway
New York City
SOLE IMPORTERS

Write for Catalogue

FOR SALE

Motors

5 in. x 4 in.-Two Cylinder
Opposed. 18 H. P.



WE ALSO MAKE

4½ in. x 4 in 2 Cylinder Opposed
5½ in. x 4½ in. 2 " "
6 in. x 4½ in. 2 " "

Our new shop will take care of your Orders.

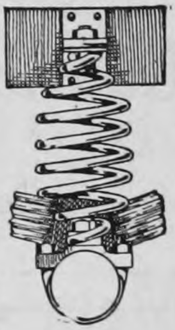
RAJAH
SPARK PLUGS

IGNITION ABSOLUTELY SURE

RAJAH AUTO SUPPLY COMPANY

BLOOMFIELD, N. J.
(Watsessing Station, D. L. & W. R. R.)
John Millen & Son, Ltd —Montreal—Toronto—Vancouver

Don't take our word for it



Accept the Say-So of manufacturers who have used thousands that Sager Equalizers have no equal.

They prevent the breaking of springs and axles; cushion engine and make riding a luxury.

OVER 40,000 IN USE

"We are entirely satisfied with them."—ELMORE MFG. CO.

"The 'Sager device' presents advantages not found in other so-called 'shock absorbers.' "—OLDS MOTOR WORKS.

"They add greatly to comfort and reliability."—CRAWFORD AUTOMOBILE CO.

"We find them indispensable."—LOGAN CONSTRUCTION CO.

"Our customers are more than satisfied with them."—DORRIS MOTOR CAR CO

"Have given us excellent satisfaction."—THOMAS B. JEFFERY CO. (Rambler.)

"The success of your shock absorbers has interested us considerably."—THE DAYTON MOTOR CAR CO. (Stoddard-Dayton)

"Used your springs with splendid success"—THE AUTOCAR CO.

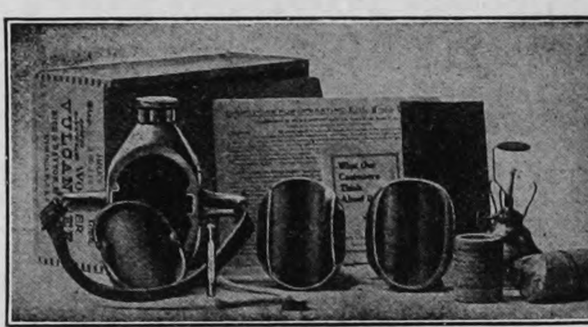
"A great benefit and we cannot speak too highly of them."—THE JEWEL MOTOR CAR CO.

"Give perfect satisfaction."—EVANSVILLE AUTOMOBILE CO. (Gearless Automobile.)

"We found your springs to be satisfactory."—POPE MFG. CO.

Write to-day for full particulars.

J. H. SAGER CO., 263 South Ave., Rochester, N. Y.



Rice & Dayton Mfg. Co.

Cedar Falls, Iowa
Makers of

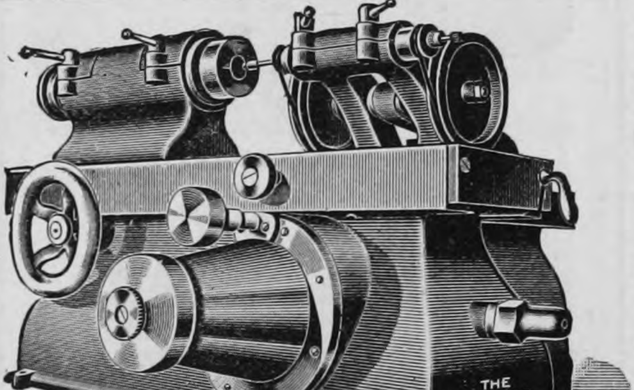
Little Wonder Vulcanizers

We challenge the world on making perfect repairs on all parts of different sized automobile tires. The new 1909 model Little Wonder Vulcanizer is just out. It is the best thing on the market and is guaranteed to give satisfaction. YOU can operate it. Are you paying too much for automobile supplies? Ask us for our Auto Supply Catalog. It is an EYE-OPENER.

Let us hear from you; we want your busines and know we can please you. Write to-day.

Rice & Dayton Mfg. Co.

CEDAR FALLS, IOWA

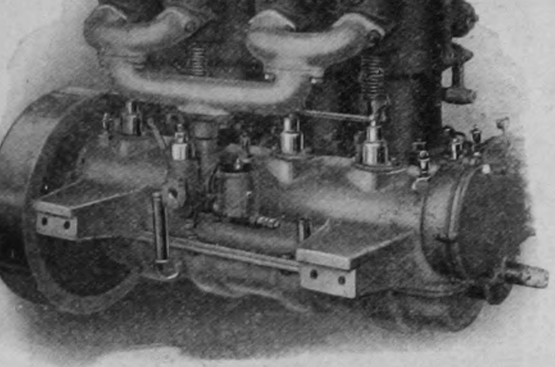


Rivett Grinders

Have you any
INTERNAL GRINDING or CUP and CONE GRINDING

to do? If so, write us for particulars of ou Grinders.

RIVETT LATHE MFG. CO.



24-30 AUTOMOBILE TYPE, 4½ in. x 5 in.

MOTORS

Individual Cylinders. Jump Spark Ignition. New Double Jet Carburetor. Unusually Big Bearings. Perfect Workmanship and Finish.

OTHER SIZES FOR ALL PURPOSES

Write for Catalogue

OFFICE AND FACTORY:
151 East 126th Street, New York

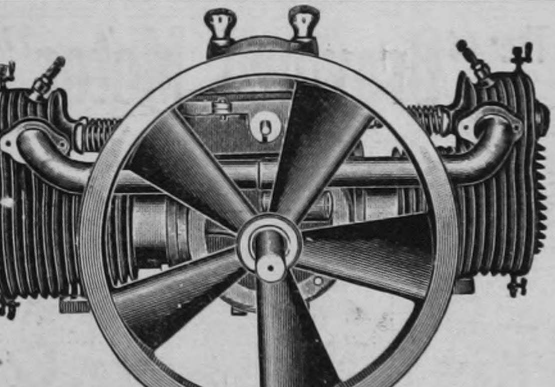
Try what a REAL top maker can do

Quality Automobile Tops

Consider it an Experiment if you will
But please remember it is an Experiment **At Our Risk!**

More Value
More Style
More Satisfaction
than in any other top you can purchase

CHAS. P. McCLELLAN
FALL RIVER, MASS.
Samples and prices upon application



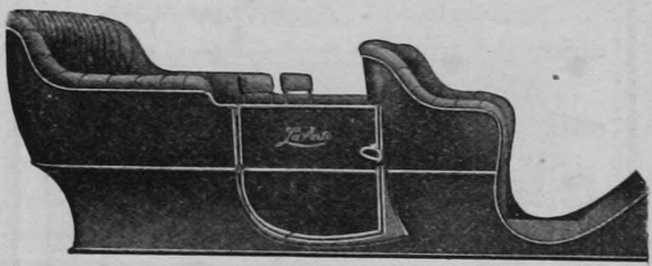
PPOSED TYPE MOTORS

uilt in sizes 4½ x 4¼, 4¾ x 4¾, x 4¾ and 5 x 5, air or water ooled.

Catalogue for the asking

LaPorte BODIES

First-class Bodies, either wood or metal, painted and upholstered complete.



We can furnish dashes in Mahogany, Walnut, etc., brass trimmed or plain.

ROADSTER BODIES and AUTOMOBILE TOPS
A SPECIALTY

LaPorte Carriage Co.

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PROTECT YOURSELF BY USING

NON-EXPLOSIVE

"NEW JERSEY"

LIQUID METAL POLISH

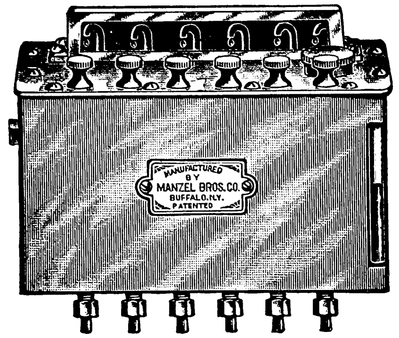
¶ A lightning cleanser, producing a polish of elegant and lasting finish on all metal work, whether hot or cold, in all conditions of heat or cold, such as brass, nickel, tin, copper, zinc; also brass, zinc and nickel signs, railings, harness trimmings, &c. It will not stain or deface wood work.

Put up in Quarter Pint, Half Pint, Pint, Quart, Half Gallon and Gallon Cans.

NEW JERSEY PAINT WORKS
JERSEY CITY, NEW JERSEY, U. S. A.
HARRY LOUDERBOUGH, Proprietor

MANZEL

FORCE FEED OILERS



For lubricating the cylinders and bearings of all kinds of Gas and Gasoline Engines.

Feed always in sight.
Each feed regulated independently.
Easily regulated.
Positive.
Any number of feeds.
Rotary or Ratchet Drive.

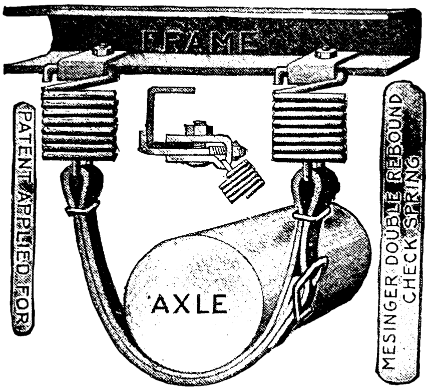
WRITE FOR FULL PARTICULARS

MANZEL BROTHERS CO.
320 Babcock St., Buffalo, N. Y., U. S. A.

The MESINGER Re-bound Check Spring

NOTHING BETTER TO RELIEVE YOU FROM BUMPS

IMPROVED CLAMP guaranteed to hold tight. No holes to drill. Anybody can attach.

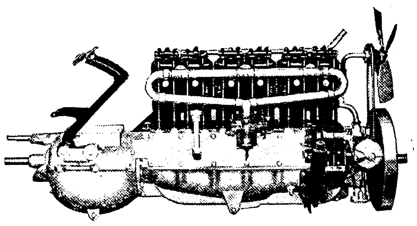


The Mesinger Re-bound Check Spring does not Defect or Dampen the Free Action of the Main Spring They check the Rebound evenly, in a pleasing motion and prevent breaking off the spring. We refund the money if not satisfactory

No. 1, for Runabouts	single, $3.00;	double, $4 50
No. 2, " Medium Cars "	4 50;	" 6 75
No. 3, " Heavy "	6.00;	" 9.00

H. & F. Mesinger Mfg. Co., 1801-03 First Ave., N. Y.

The "Brownell Motor"



Unit Power Plant, Automobile Model A-6

Stands for BEST throughout in type, design, proportions, material and workmanship. Nothing has been neglected.

Our three-point suspension Unit Power Plant, the ideal outfit for the Automobile Assembler,

HAS NO EQUAL

Built in several sizes from 3½-inch bore by 4-inch stroke, up — in 4 and 6 cylinders.

Heavy Motors and Transmissions for trucks up to 5 tons capacity

A POSTAL :: A CATALOG

F. A. Brownell Motor Company
Rochester, N. Y.

ALBANY GREASE

There is a *difference*

between oiling and lubricating. The former means trying to control a liquid in a bearing that isn't fluid-tight. Lubricating as we mean it, is done with a firm, natural-bodied, self-acting, plastic body that stays where it is put and feeds automatically into the bearing as the bearing itself needs it.

That is what Albany Grease does—because it is the right grease—made right and easy to use right.

Samples free—visit our Exhibit at the Atlanta Show.

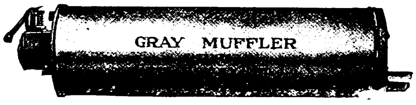
ADAM COOK'S SONS

ONLY MAKER

New York, - U. S. A.

IS IT A GRAY—

OR AN IMITATION?



The Efficiency, Appearance and Demand for the

GRAY MUFFLER

has caused makers of Freakish Catch-Name mufflers to discard their Theories and imitate the Practical and Quiet GRAY.

The above shows a Gray model introduced in 1907. Note the cut-out in front head—the collector and tail pipe at rear—note its general appearance and how closely it is NOW imitated.

There's a reason—The GRAY Muffler is Popular. It Sells and gives Satisfaction. All Good articles are imitated, but the Material, Workmanship and Square Dealing which made the Original a Success are not found in imitations. Our 1907 model was right—Service has proven it. Our 1910 is better. It is 3 years ahead of our imitators. Buy the original from the originators and secure the best. The cost is but little more. Write for catalogue, Muffler Department.

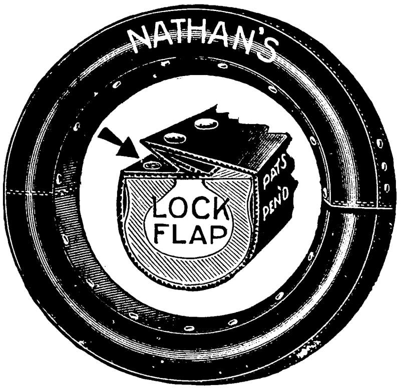
GRAY-HAWLEY MFG. CO.

DETROIT, MICH.

Motor Car and Motor Boat Accessories

Nathan's Lock Flap Tire Covers

ARE THE STANDARD



EASY TO PUT ON AND TAKE OFF

The only perfect fitting Tire Cover that is water and dust proof when placed in any position.

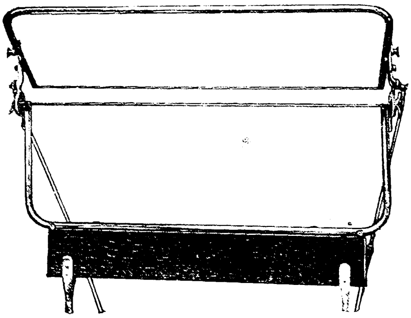
THE LOCK FLAP MAKES IT WATER AND DUST PROOF

Directions:—Simply adjust snugly about tire. Lock the flap and snap the buttons.

Send for new prices. Nathan's Tire Trunks and other fabric supplies are still in the lead.

NATHAN NOVELTY MFG. COMPANY

84 to 90 READE ST., NEW YORK CITY



SEE THAT GAP

One of the Many New Attractive Features Making

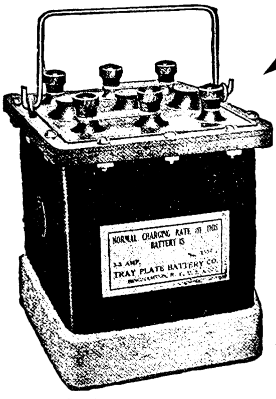
VASCO WIND SHIELDS

an ornament and necessity on every car. No Springs. Automatic. One hand control. Take no chances—Buy the BEST. Ask for Catalogue A and prices.

Victor Auto Supply Mfg. Co., Inc.

42 West 43rd Street, NEW YORK

Factory: Providence, R. I.


NORMAL CHARGING RATE OF THIS BATTERY IS
3.5 AMP.
TRAY PLATE BATTERY CO.

6 Volts, 60 Amperes

"High Efficiency"

"Something Good"

"High Efficiency Batteries"

Actually Give

Greater Results and Hotter Spark

than other batteries

1200 to 1500 Miles on Our No. 660

1902 1909 **TRAY PLATE BATTERY COMPANY** 1902 1909

24 Wall St., Binghamton, N. Y.

The Sparks-Withington Co., Ltd.

Grand River and Ganson Street, JACKSON, MICHIGAN

Manufacturers of Pressed Metal Products

Brake Drums, Flanges, Ball Cups, etc. No part too big for our capacity

WE MAKE THE BEST RADIATOR FAN ON EARTH

Aluminum, Bronze, Manganese Bronze

CASTINGS

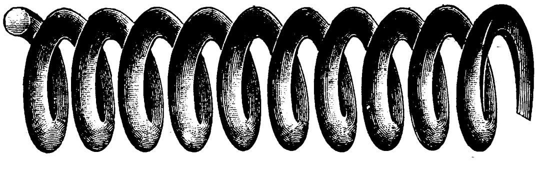
"SUPERIOR" BABBITT

"PLATA" WHITE BRASS

25 YEARS' EXPERIENCE

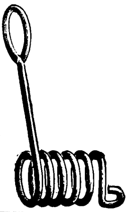
ROCHESTER
New York

CLUM & ATKINSON

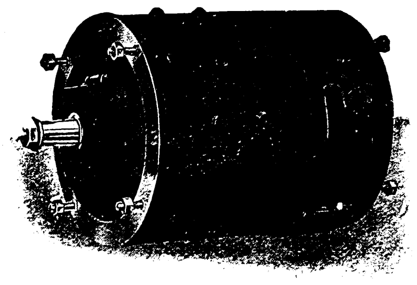


Don't Worry about Spring Troubles!

Send us your specifications and let us figure on your requirements. Everything in the spring line, either flat or round stock, made promptly, to order.



The Wallace Barnes Co., Bristol, Conn.

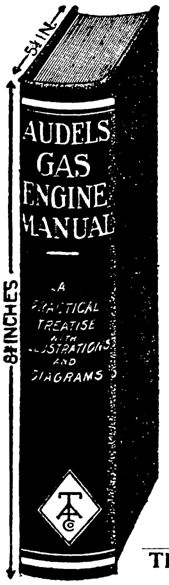


Westinghouse
Automobile and Power Wagon Motors

Designed to meet every construction of vehicle. The automobile differ from the power-wagon motors, each type having qualities with special reference to their intended applications.
Full particulars in Circular 1059.

Westinghouse Electric & Mfg. Co.
Pittsburg, Pa.
Sales Agents, AMERICAN DISTRIBUTING CO.
American Trust Bldg., Cleveland, Ohio

GAS ENGINE MANUAL


5¼ IN.
8¼ INCHES
AUDELS GAS ENGINE MANUAL
A PRACTICAL TREATISE WITH ILLUSTRATIONS AND DIAGRAMS

¶ This volume, just published, gives the latest and most helpful information respecting the construction, care and management of **Gas, Gasoline** and **Oil Engines, Marine Motors** and **Automobile Engines**, including chapters on Producer Gas Plants and the Alcohol Motor.

¶ The book is a practical educator from cover to cover and is worth many times the price to any one using a gas engine of any type or size. Contains 512 pages, 27 chapters, 156 diagrams, size 5¼ x 8¼ inches, weighs 2 pounds, handsomely bound, and in every way a fine volume.

SPECIAL OFFER

¶ *The only way the practical merit of this* Manual *can be given, is by an examination of the book itself, which we will submit to the readers of Trade Journal, free for examination, to be paid for or returned, after looking it over.*

¶ Upon receipt of the following agreement (which can be either cut out or copied), the book will be immediately forwarded.

No money in advance required; sign and return

Theo. Audel & Co., 63 Fifth Ave., New York

Kindly mail me copy of "Audels Gas Engine Manual," and, if found satisfactory, I will immediately remit you $2.00, or return the book to you.

Name ....

Address ....

Cycle

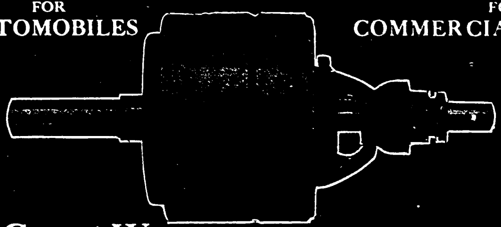
SAVE HALF THE TIME
of the Lathe Work by using Our New
CRANK SHAFT LATHE

THE LODGE & SHIPLEY MACHINE TOOL CO.
Cincinnati, Ohio

BALL TRANSMISSION GEARS

FOR AUTOMOBILES

FOR COMMERCIAL VEHICLES



HIGHEST GRADE

MOST RELIABLE

SIMPLEST

EASIEST TO INSTALL

NEW YORK GEAR WORKS, GREENPOINT AVENUE NEAR WEST STREET BROOKLYN, N. Y.

HUBLER-DAYTON
STORAGE BATTERY
THE DAYTON ELECTRICAL MFG. Co
DAYTON, OHIO, U.S.A.

Hot Sparks Always Ready

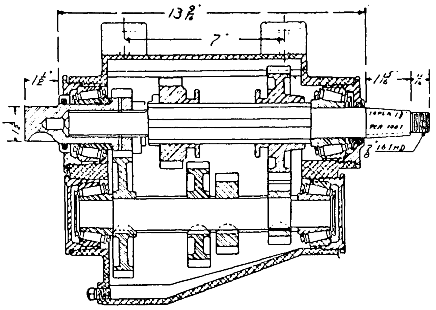
Your ignition and lighting current is sure if you use a

Hubler-Dayton Storage Battery

Compact, proof against jolts and jars, and guaranteed to give faultless service. Made in the same factory as the famous Apple Ignition Dynamo. Write for catalog describing our complete line of ignition specialties. Do it now.

The Dayton Electrical Mfg. Co.
89 St. Clair Street, DAYTON, OHIO

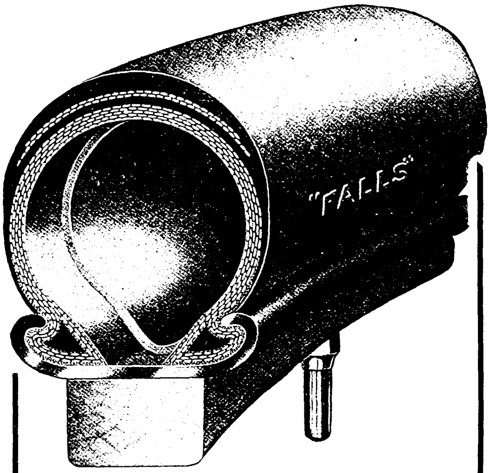
B-T-K PARTS



Five styles of **selective transmissions** for 1909-10; also **selective and progressive side levers; cone clutches,** bronze or leather face, with or without cork inserts; **Universal joints; steering gears;** and **brass plating done to order. We make parts to your designs** and are designing new parts for 1910. **We make a specialty of gear cutting** where blanks are furnished.

Write for catalogue and prices.

Auto Parts Manufacturing Co.
MUNCIE, IND.



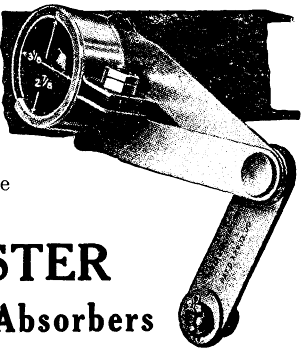
"FALLS"

Automobile, Bicycle and Motor-Cycle Tires represent the highest degrees of efficiency. Write for Catalog "A."

Falls Rubber Company
AKRON, OHIO

Wouldn't It Jar You!

There's no doubt about it if you are riding with Shock Absorbers that bind the springs so tight they are stiff.



FOSTER
Shock Absorbers

are different. They allow the springs to act freely until you strike a bump—then they gently take the jar out—that's all.

Built on right principle, free in center and bind gradually going up and coming down.

ASK ANY MECHANIC
Agents Wanted Everywhere—write for Book

FOSTER SHOCK ABSORBER
1412 E. 40th Street :: :: CLEVELAND, OHIO
NEW YORK BRANCH : 1926 Broadway

HAZARD HIGH-GRADE Motor Power Plants

Motor, Disc Clutch, Transmission constructed in one unit. **Simple, Powerful, Light.** All parts enclosed. **Three Point Suspension** eliminates all chances of motor being strained or twisted. Designed to produce the Highest Grade of Motor Power Plant.

DESCRIPTIVE MATTER ON APPLICATION

Hazard Engineering Co., Dept. J, Rochester, N. Y.

MANUFACTURERS, WHY NOT?

When contracting for STEERING GEARS take advantage of years of experience in the building of this part of your car.

We Have 50,000 square feet and thousands of dollars' worth of special machinery for the manufacture of steering gears.

We Make every part, from the wheel to the ball arm.

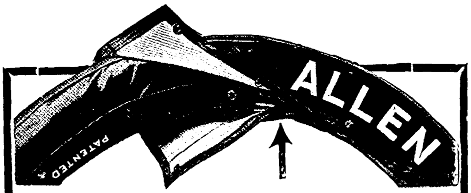
Therefore we guarantee deliveries our customers can depend upon.

GEMMER MANUFACTURING COMPANY

Write for Catalogue at Once

Detroit, Mich.

BRANDENBURG & CO., Sales Agents
NEW YORK CHICAGO

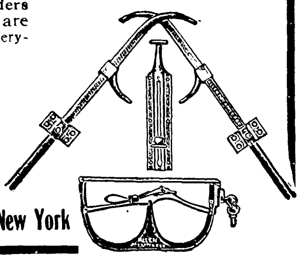


This Tire Case Absolutely Water-Proof

ALLEN TIRE COVER

Is the only tire cover which fully protects your tires. It is an ornament to any car. Any color combination. Made of the best enamel drill and—it buttons on. Accept no substitute. Ask for "ALLEN'S."

Allen Tire Holders and Tire Locks are standard. Used everywhere. See that they are part of your equipment. "What we do we do well."



Allen Auto Specialty Co.
1926 Broadway, New York

MORGAN & WRIGHT TIRES ARE GOOD TIRES

You will notice that the motorists who have any doubts about this statement are the ones who have never given

Morgan & Wright Tires a thoro trial.

MORGAN & WRIGHT
DETROIT

DEALERS ONLY

Do not fail to send for our proposition on

TIRE CHAINS

No dealer can afford to miss it and we can only offer it to a limited number, so

QUICK ACTION WILL BE NECESSARY

Empire Auto Supply Company

283-285 HALSEY STREET :: :: :: NEWARK, NEW JERSEY

1910 CORREJA CAR

$2200.00

THERE IS A REASON WHY

If you pass it by you are a dead one.

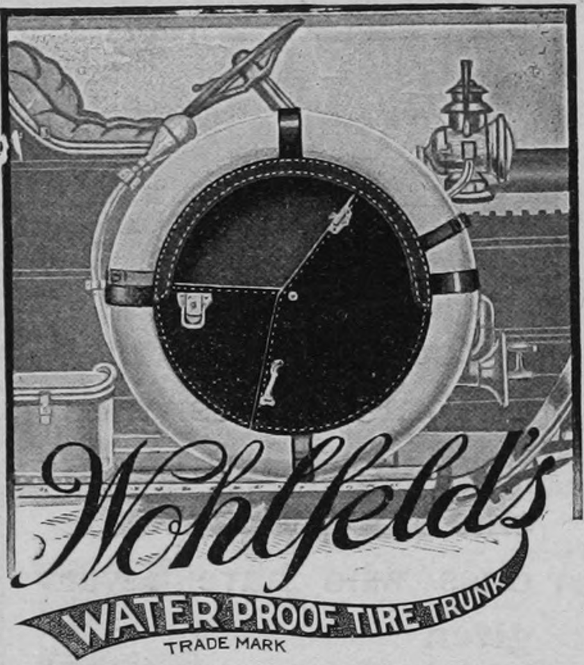
A High Grade Car built of the Best Material obtainable.

4 cylinders, 50 H. P.

Silent and Powerful.

Vandewater & Co.

71 to 79 Prince Street
ELIZABETH, N. J.



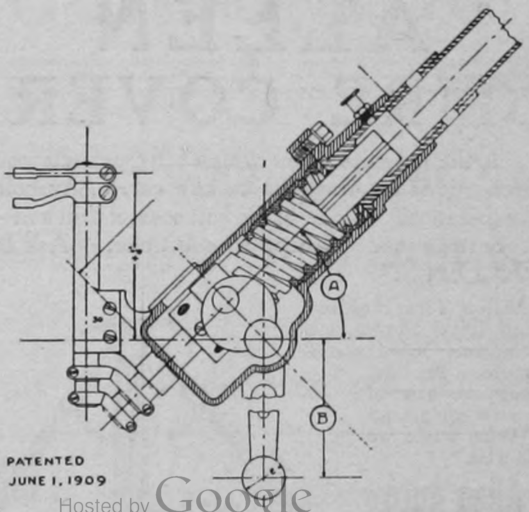
PATENT APPLIED FOR

This is the only tire trunk that does not leak, admit dust, or suffer from the shock of travel. More available space, contents easier of access, no hinge to break, revolving lid always in place and always out of the way, a lock instead of a buckle. Thoroughly well made of three-ply veneer basswood and trunkboard, covered with enamel duck, all edges bound with leather and stitched by hand, felt lined—made to fit any size tire. $13.50 at the auto supply houses—or we ship direct, express prepaid. Send your address for catalogue of all kinds of motor

"S & W" Stationary Nut
STEERING GEARS

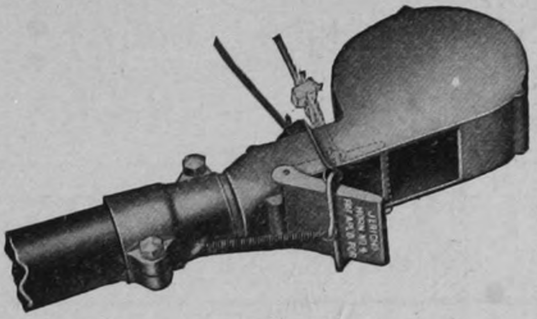
"S & W"
Safety Electrically Welded
STEERING REACHES

Durable and Strong



The SCHWEPPE & WILT MFG. CO.

JERICHO
The Road Clearer



Blown by the Exhaust

Cannot clog. Requires no cut-out

4 Sizes: $7, $8, $9, $10

Booklet 24 on request.

Ask your dealer or send make and model of car to

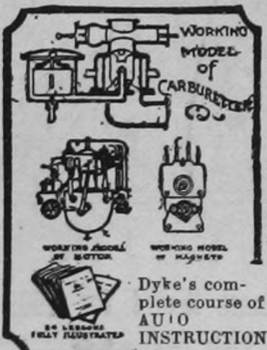
The Randall-Faichney Co.

SOLE MAKERS

BOSTON :: :: U. S. A.

LOOK!

READ AND THINK! ANY ONE CAN DRIVE A CAR BUT WHEN IT GOES WRONG?


WORKING MODEL of CARBURETOR
WORKING MODEL OF MOTOR
WORKING MODEL OF MAGNETO
24 LESSONS FULLY ILLUSTRATED

Dyke's complete course of AUTO INSTRUCTION

ISN'T IT WORTH $10 TO BE MASTER of THE AUTOMOBILE AND GASOLINE ENGINE AND KNOW ALL ITS DETAILS?

With Dyke's System of WORKING MODELS that actually work and our 24 simple LESSONS and CHARTS we guarantee to teach you the subject thoroughly.

Setting valves and timing ignition made perfectly clear

This is positively the only course in the world that can be successfully taught by mail. We will show you reproductions of letters praising our course from all classes of people.

An AUTO OWNER writes that he saved the cost the first week.
A SHOP MAN writes that he learned more in a short while studying our course than years of work around the shop.
ONE OF OUR CUSTOMERS is now running a repair shop.

Turn Spare Time Into Pleasure and Profit.

Just imagine having in your room an engine cut in half and with each and every part lettered and numbered, also a carburetor and magneto on your study table while you study our interesting lessons—that is practically what we give you in our working models. You will play with the working models (which actually work) like a boy with a toy and the more you play the clearer the subject will be to you.

Our system is something entirely new and different.

Our Trial Offer—We will send the course on two days' inspection on receipt of price. If it is not satisfactory, return and get your money back. Pay $5 cash and $5 in 30 days.

FREE Instructive Pamphlet. SEND FOR IT TODAY.

A. L. DYKE, 1400 Bk. Commerce Bldg., St. Louis

On Sale at 1451 Michigan Avenue, Chicago, Illinois

Chiltonn Stock Designs

OF

POST CARDS

are money-makers for automobile dealers

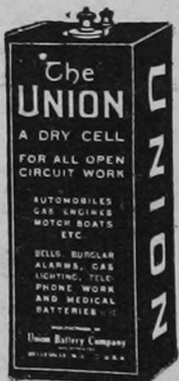
Send for Specimen Sheet No. 101

Chiltonn Printing Co.

The Ones You Now Use Can't Equal These

TRADE
NUE
No 6
MARVELOUS STRENGTH AND ENERGY
NUE
UNION BATTERY CO.
SOLE OWNERS — MANUFACTURERS
BELLEVILLE, N.J.
U.S.A.

NUE, a high-grade Battery for ignition work, constructed on entirely different lines than any other cell made. It has a guarantee of 34 amperes with less depreciation than the cell you are now using. A good, fat, hot spark always assured by their use.


The UNION
A DRY CELL
FOR ALL OPEN CIRCUIT WORK
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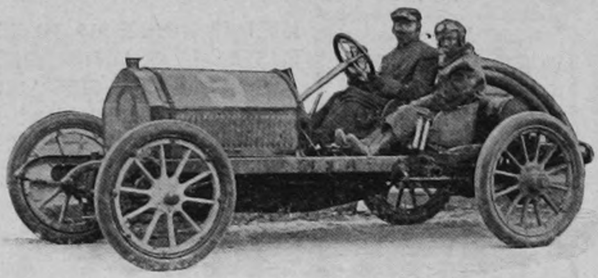
THE UNION Dry Cells are made to withstand the great consumption of current used by the average coil. They stand up under all conditions and will give perfect satisfaction with long life and great energy. Ask your dealer or send direct for booklet.

Arrow" Car



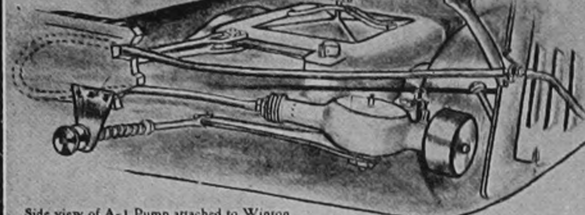
Establishes New Long Distance Record for 1909

205.2 Miles in 190 Minutes

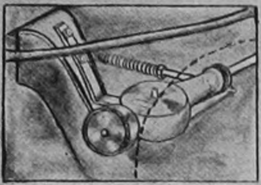
IN the Long Island Automobile Derby, September 29, **SHARP ARROW** made the greatest speed—**64.8** miles an hour—ever achieved by any American Stock Car for the distance of 200 miles or over, surpassing its own sensational feat of the Vanderbilt Motor Parkway Sweepstake Races, **this time** out-running all the cars in the two classes above, being, at the end of the 9th lap, 5 minutes ahead of the Fiat Car driven by De Palma, winner of the biggest class, **SHARP ARROW** covering this lap, 22.8 miles, at the rate of

73 Miles an Hour

Office and Factory, TRENTON, N. J.



Side view of A-1 Pump attached to Winton



End view of A-1 Pump attached to Winton

Showing manner of attac
Auto Power Tire Pump to
cylinder Winton. Can be
tached to any Winton m
either four or six cylinder.

YE ATLANTA SHOWMEN

We present herewith cut of the "Winton" f
showing the Rohrbacher Wind Jammer firmly bol
to car.

WHAT THE PUMP WILL DO

It will inflate your tire to 80 lbs. pressure in two m
utes. It will instill confidence on your tour and
crease your pleasure, as the flat tire is no longer fea
It will save 75% of your tire expense. It is ea
installed. Is operated without trouble. Is worth
price of your Auto when past annoyances are cons
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peek through the key-hole of doubt at this li
wonder before you lift the latch. Let her in—ins
her on your car; she will not only jam your tires,
will jam away your tire troubles. Let us hear from y

Rohrbacher Automatic Air Pump Co
Portland, Oregon

AUTO. BARGAINS

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FACTS: High grade cars have four times the wearing qualities and durability of the cheap new car. Well made cars of high grade material are at their best after a few months' service and DO LAST FOR YEARS.

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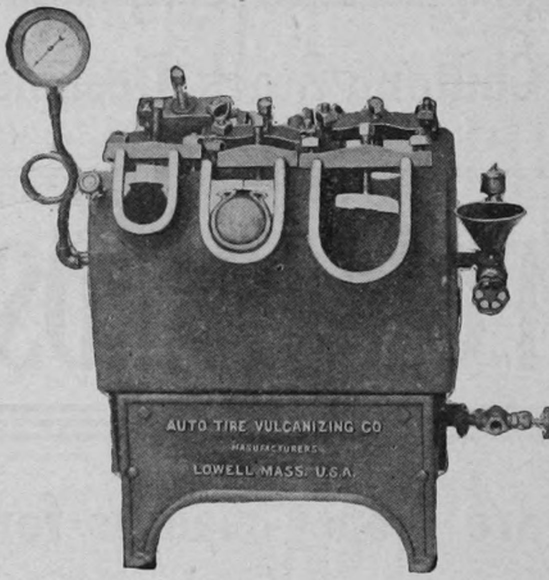

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1910 Model Adjustable Sectional Vulcanizer wi
three cavities. Capacity from 2" motorcycle to 4½" aut
mobile tires. It has 12 pair of bead irons, thus insuri
a perfect fit for all the various makes of tires, eith
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fastened, also the double Clincher type of motorcy
tire. This vulcanizer is furnished with gas or gasoli
burner or to connect direct with steam boiler. Our ne
1910 vulcanizer is cast in one piece and is steam jacket
like all our other vulcanizers. You cannot afford to
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It is a money saver and a money maker. Write f
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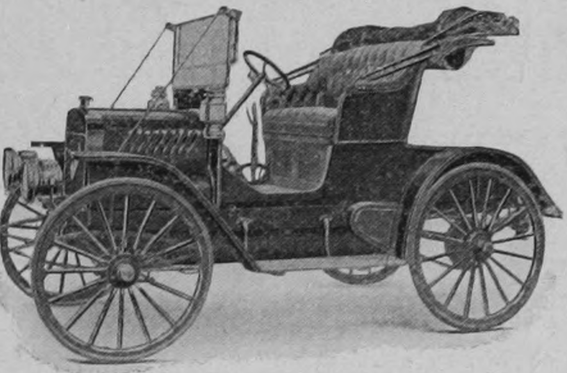

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out a solid tired Automobile. Freedom rom tire and mechanical troubles is the esult of owning a **Babcock.** Built only for hose willing to pay for quality and worknanship. If you are looking for an autonobile at buggy price, don't write us. Otherwise write us for further information nd printed matter.

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With or Without Gold Initial

are the Ideal Automobile Gloves for winter.

The "Rist-Fit" is an exclusive feature. It is patented and found in no other Auto Glove. A "V" of soft leather is set into the cuff, giving a close, smooth fit at the wrist, with one pull of the strap or woven tape. The gauntlet never sags and all wind, snow and dirt is excluded.

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Examine a pair of these gloves at our expense—just send us your dealer's name, with the size and style you prefer and a pair will be promptly sent you prepaid. For men and women.

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Originators and Patentees of Ventilated and "Rist-Fit" Gloves.

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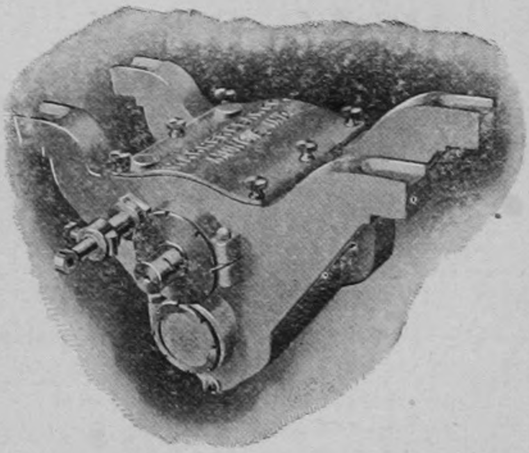

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For Timken Roller Bearings and Annular Ball Bearings

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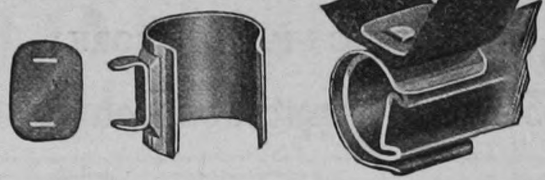

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Made of Spring Brass

Manufactured by
Detroit Auto Shield Company
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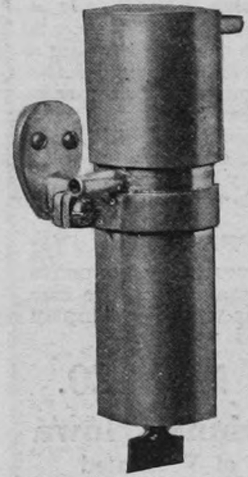

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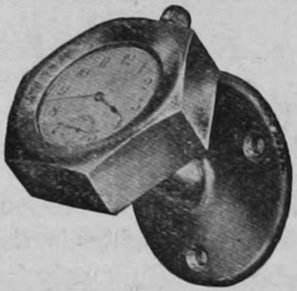

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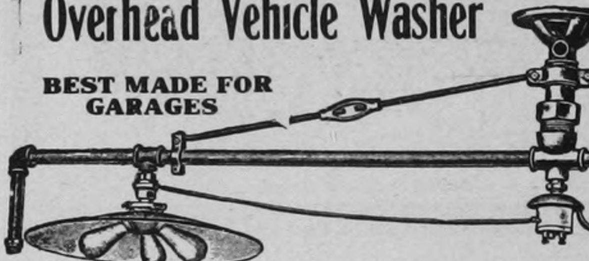

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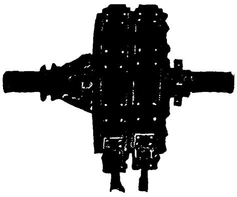

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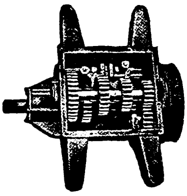

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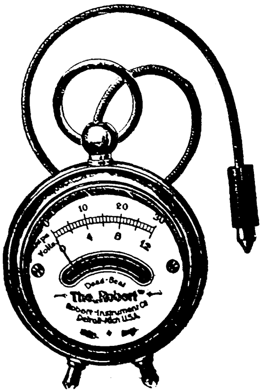
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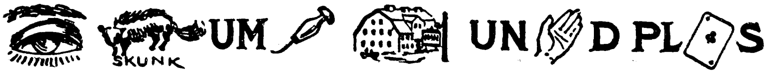
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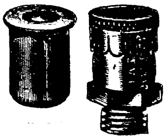

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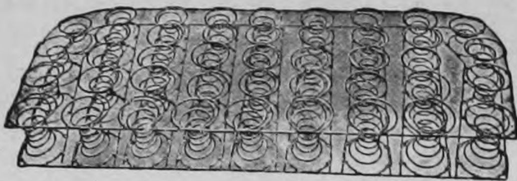

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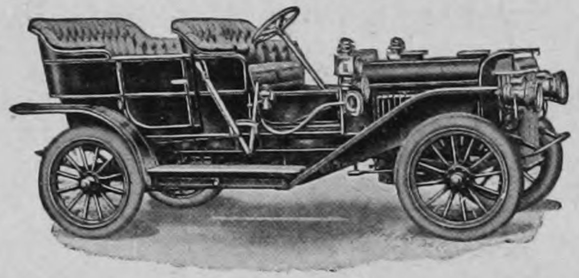

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It will pay you to send for our instruction booklet on the subject of ignition batteries.

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Best for Sparking

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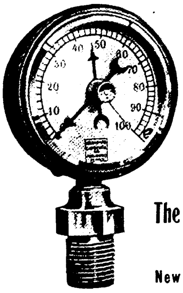

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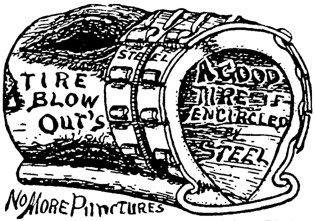

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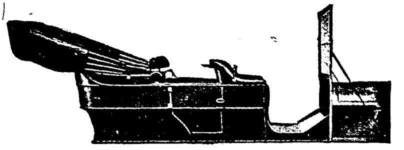

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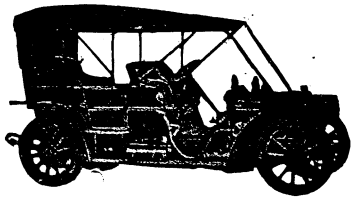

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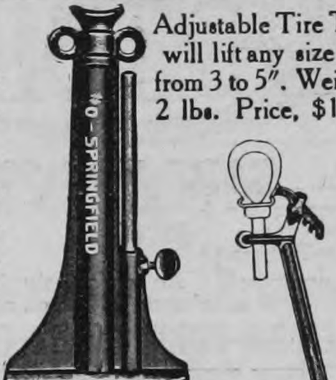

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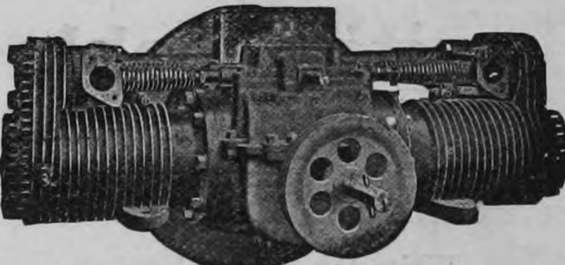

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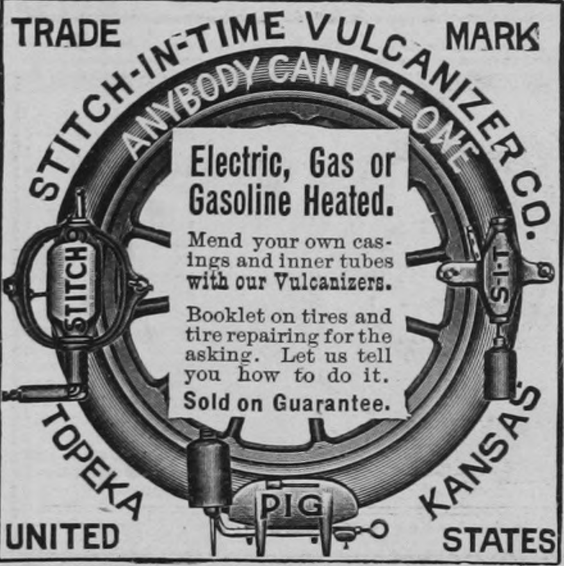
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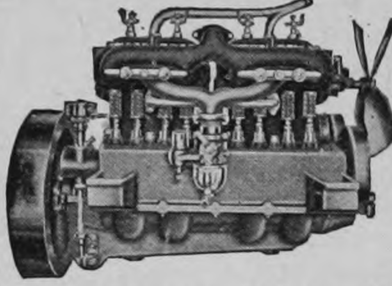
have a train of satisfied users everywhere. If you want good circulation on your Automobile, Launch or Motor Boat, use a **LOBEE PUMP.**
Write for circular and prices.



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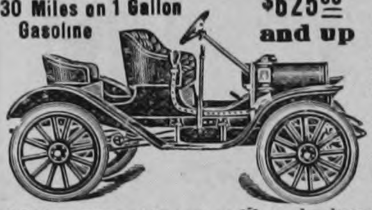
Speedy—Roomy—Strong—Handsom

30 Miles on 1 Gallon Gasoline



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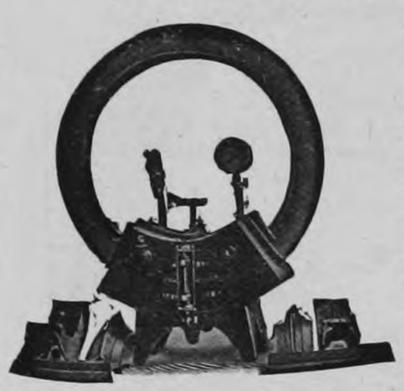

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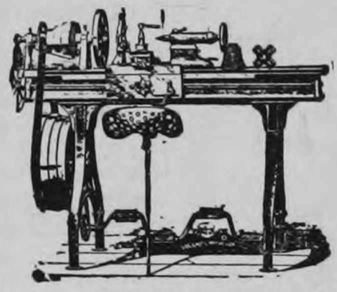

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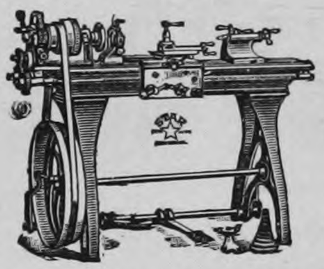

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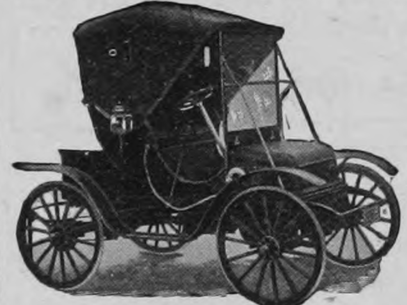

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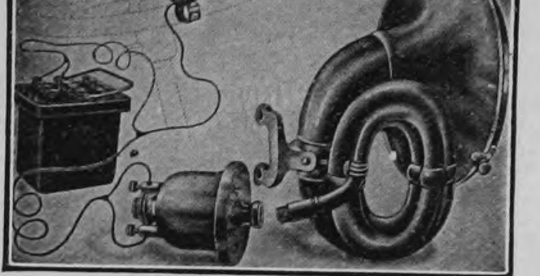

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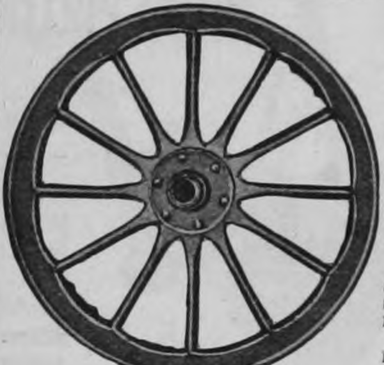

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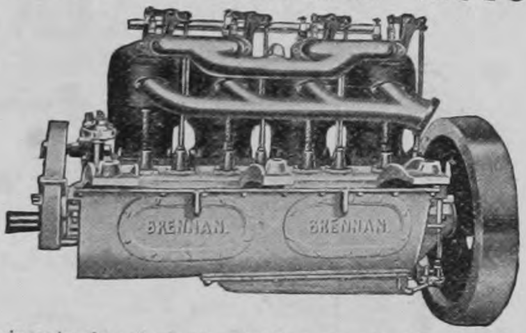

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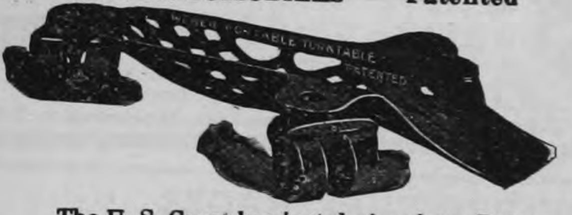
FOR AUTOMOBILES Patented



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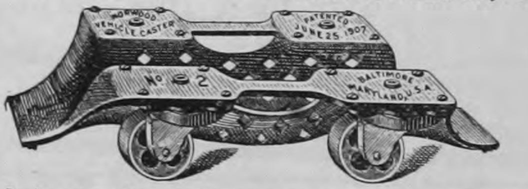
For Automobiles Patented, June 25, '07



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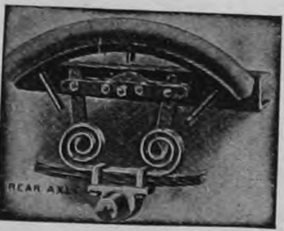

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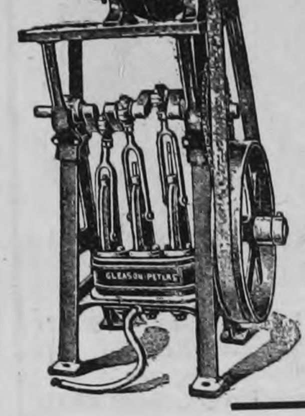

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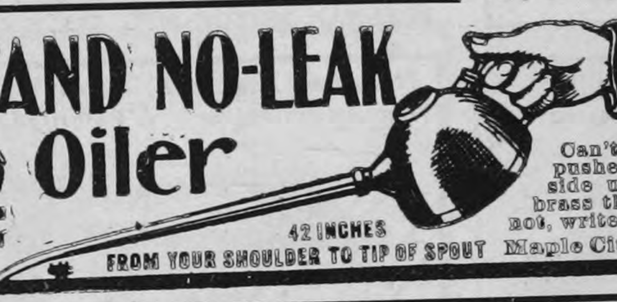
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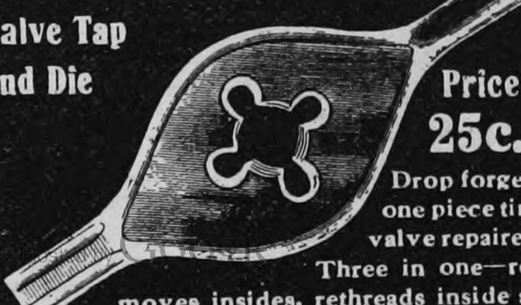

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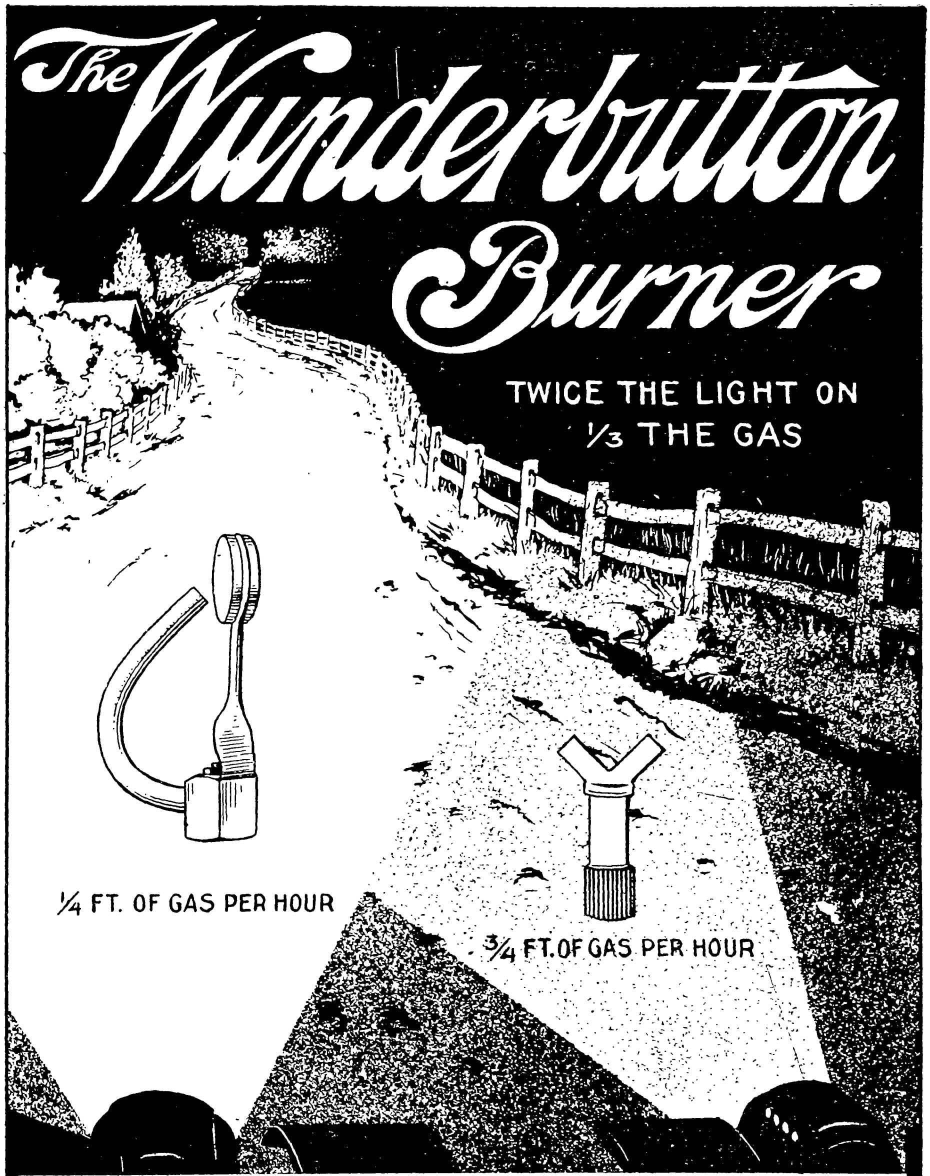
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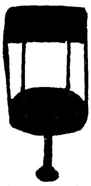

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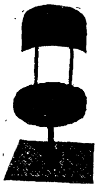

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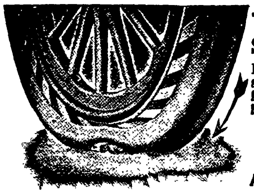

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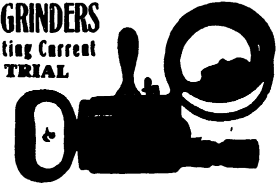

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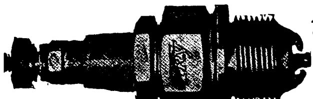

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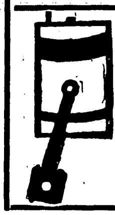

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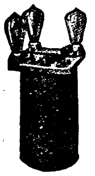

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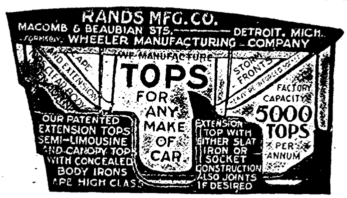
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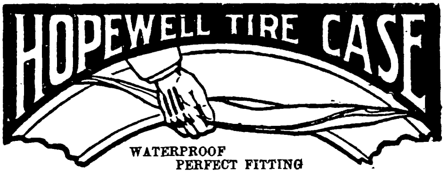

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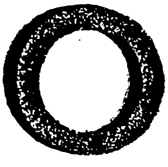

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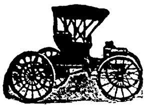

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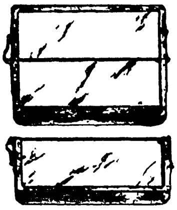

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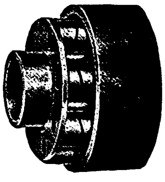

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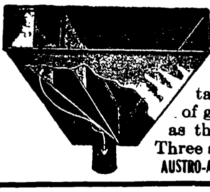

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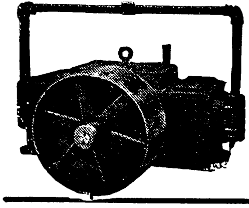

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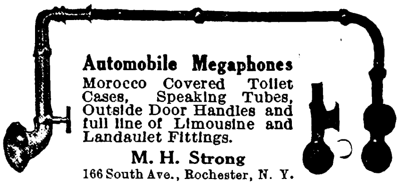

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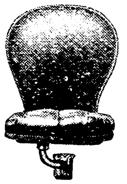

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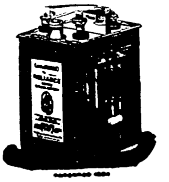

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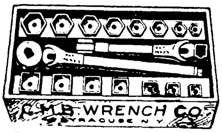

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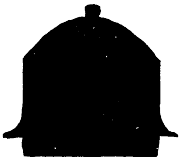

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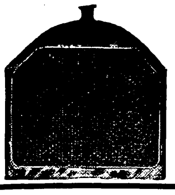

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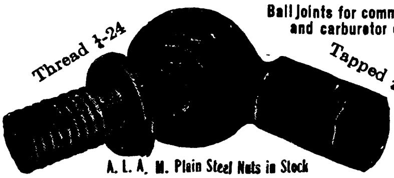

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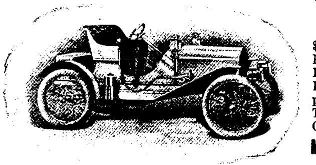

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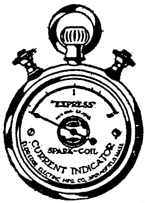

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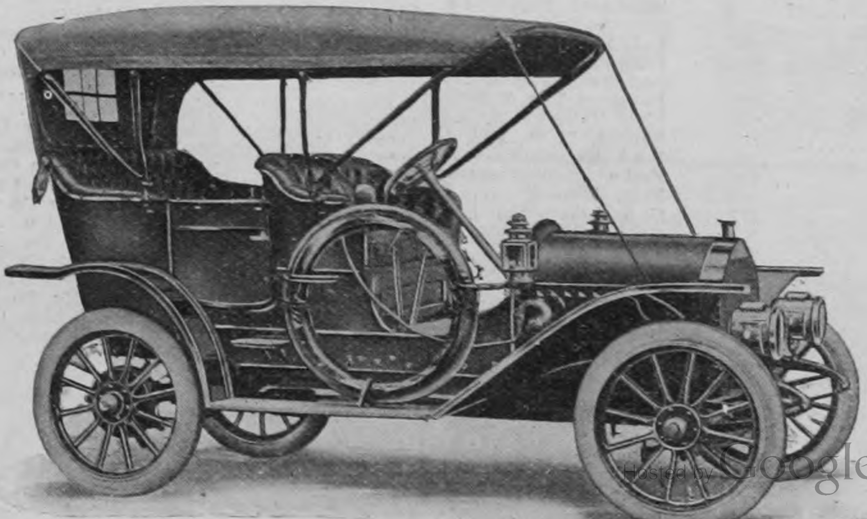

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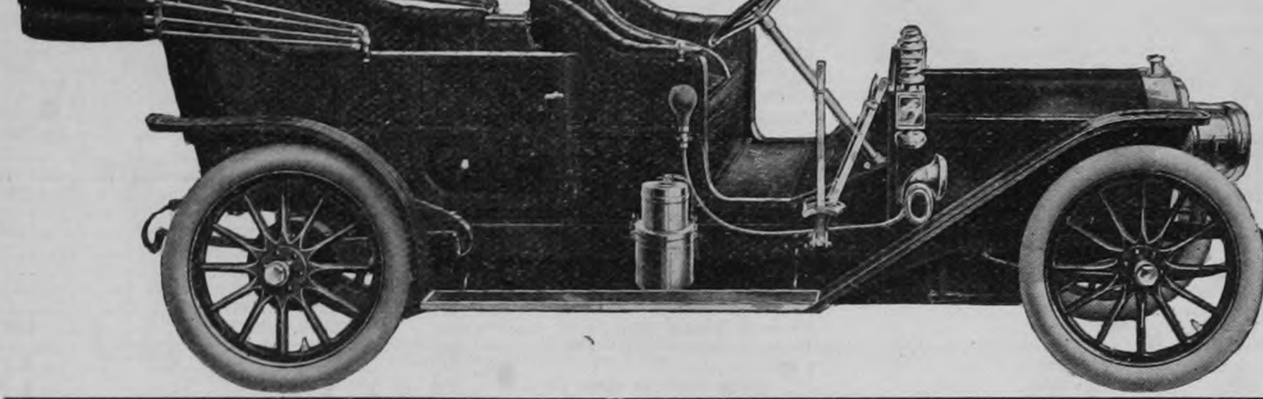

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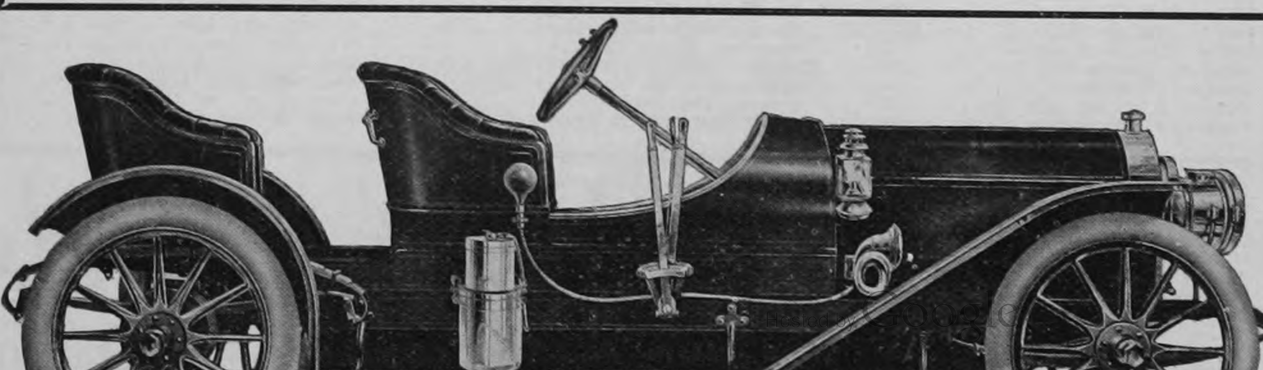

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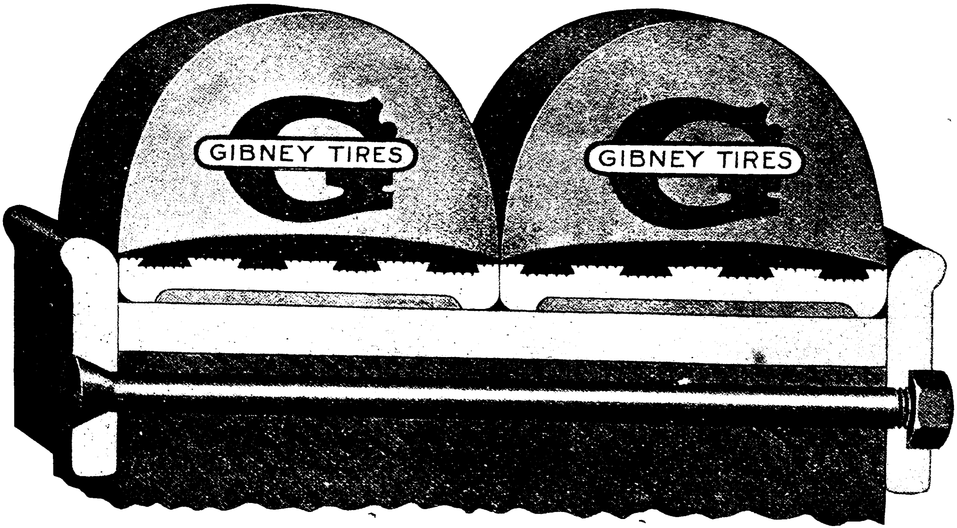

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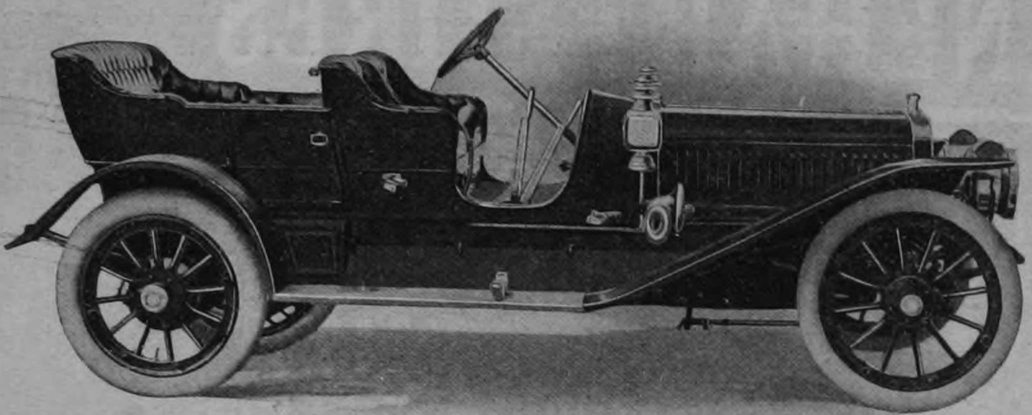

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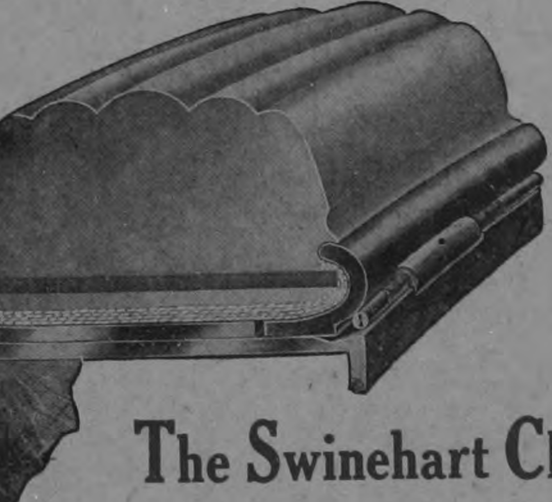

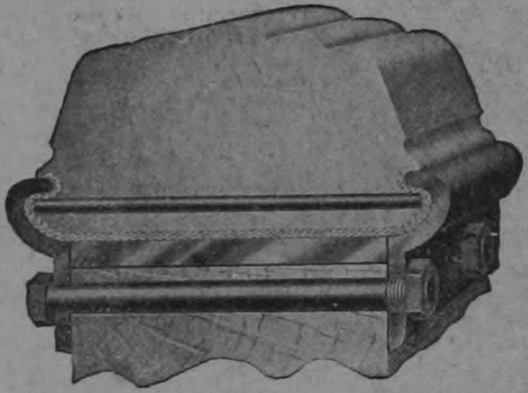

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¶ The success of our quick detachable rims during past seasons has demonstrated that truck owners appreciate this feature.

¶ Our clincher tires with improved quick detachable flange rims make it possible for an amateur to change tires in thirty minutes. The nuts on one side are simply taken off, one flange removed, old tire slipped off, new one put on and flange replaced. No tools other than wrench and a few bars required.

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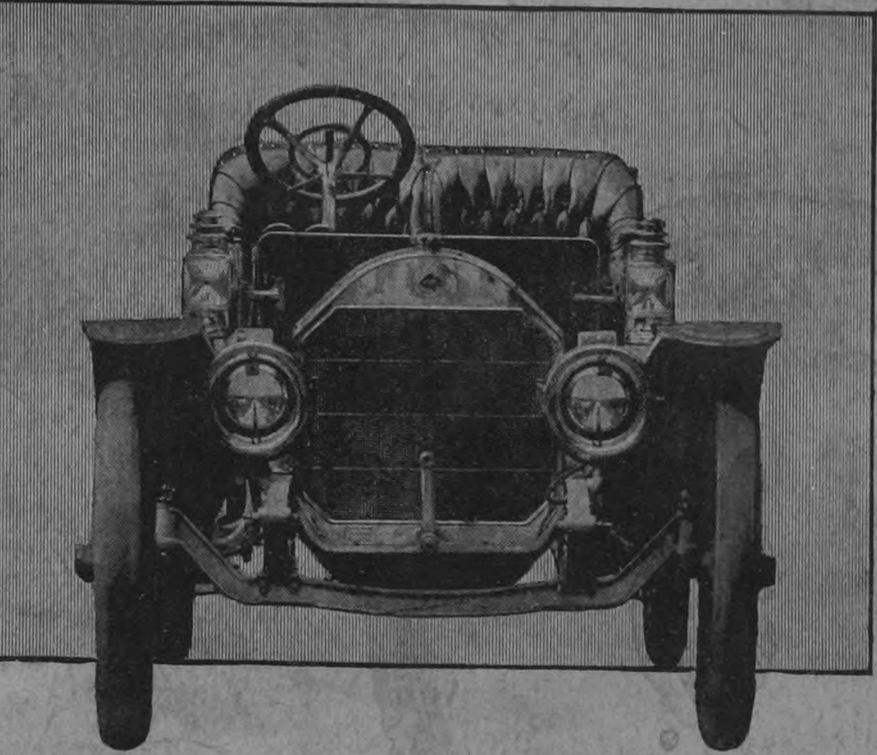

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5 Passenger To
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Ignition, - - $2
Double Ignition, 2

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5 or 7 Passenger T
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Ignition, - - $3

TO carry conviction, the record performances of any car should represent its *average* performances.

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The PREMIER has never competed in *easy* events arranged solely with a view to record making. But, in its long career of *real*, endurance-testing struggles, and in every instance of private service, PREMIER performances have proved invariably of the same conclusive character.

Write to us for the full PREMIER facts and records. Or call on our nearest PREMIER Agent. 1910 Models ready.

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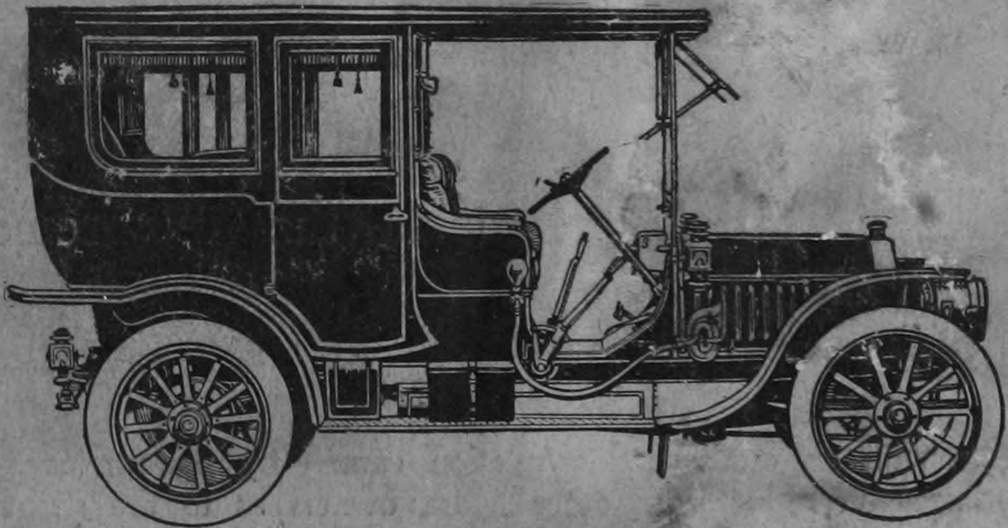

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Catalog F will be sent on request

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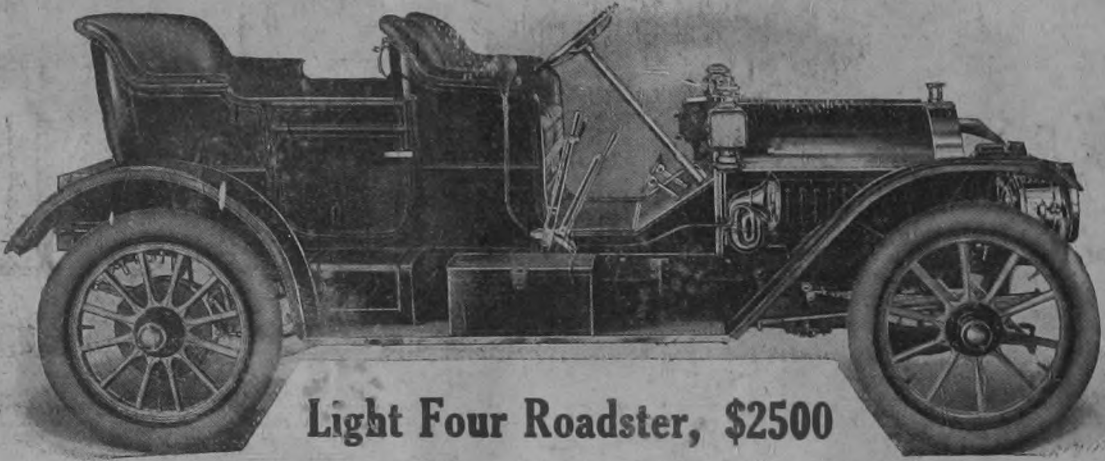
Get A Mora 1910

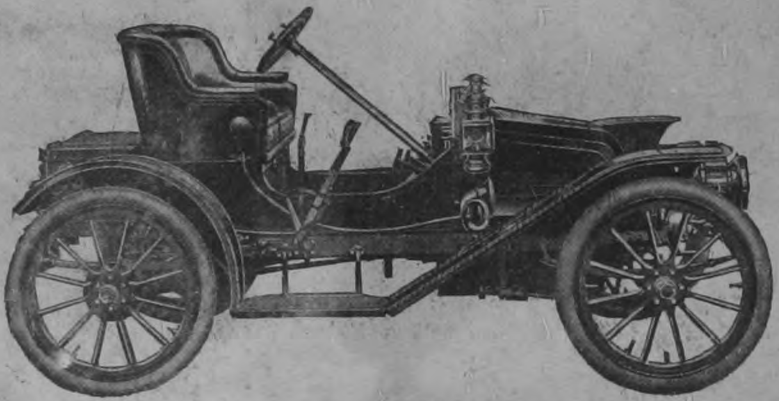
LIGHT FOUR

MECHANICALLY RIGHT.

GOOD FOR YEARS



Light Four Roadster, $2500



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THE 1910 Mora meets the requirement for a

"Strenuously Reliable"

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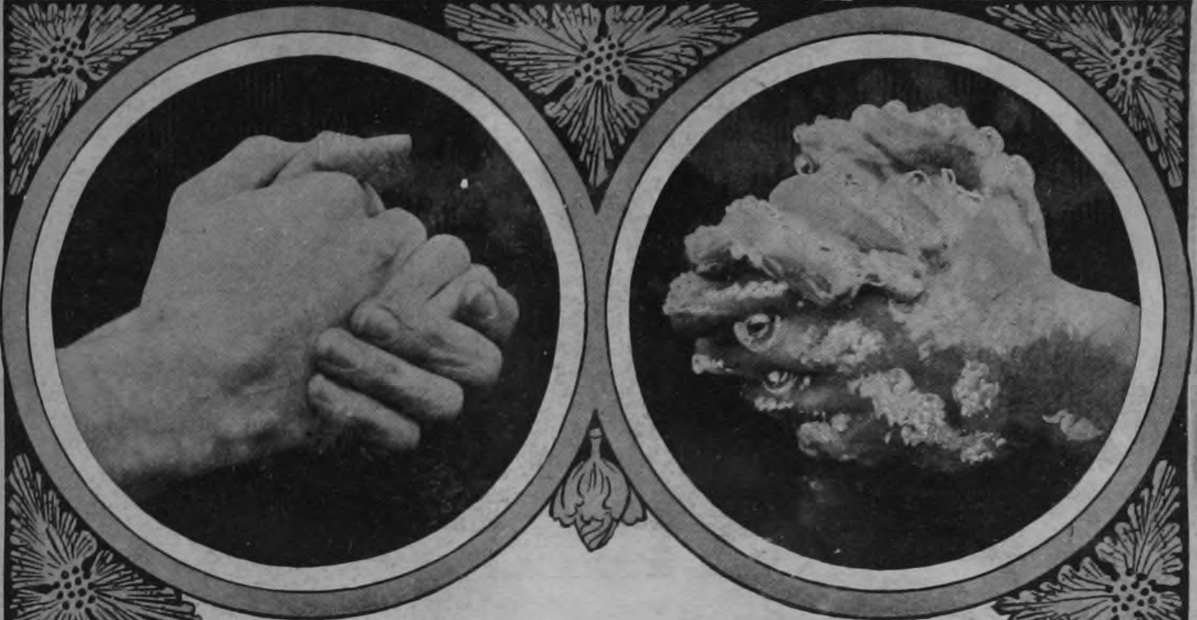

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Is a 100% Lubricant

Being free from alkali and other injurious ingredients, it is a lubricant which can be used with safety on all bearings of your car. Most other greases are not absolutely pure.

¶ A simple test is to place a small quantity in your hands and then see if it will lather in water. If it lathers it is an imitation, containing injurious ingredients, which will attack metal and injure the bearings of your automobile.

¶ Why take any chances when you are sure of protection if you insist upon having **KEYSTONE GREASE.**

¶ Every one interested in perfect lubrication for his Automobile is invited to call at our booth during the Automobile Show. We expect to have on display there a complete transmission and differential gear case outfit in operation, where **KEYSTONE GREASE** will be shown under severest conditions.

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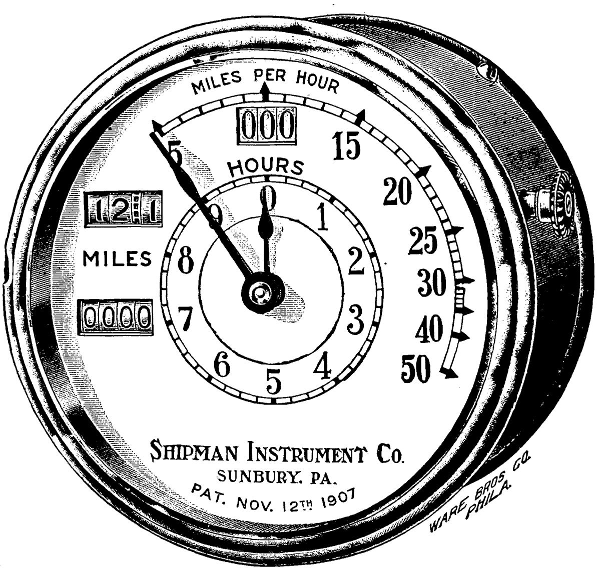
The Shipman Speed Indicator is the only instrument that records the hours of the trip as well as the miles



It shows accurately and automatically at all times HOW LONG, HOW FAST, and HOW FAR you have traveled.

This is an entirely new, original and exclusive feature. The hours of a trip are recorded only when the car is in motion, so that the actual time between points is recorded. The dial in the illustration shows the principle of this feature. When the automobile is in motion, the instrument is automatically wound, which feature is covered by patents.

The instrument registers the miles for trip and season, the hours for trip and season and the speed at all times. It is absolutely accurate, as it is along the lines of established time devices, with well-designed escapements such as have been recognized for centuries as standard.

The speed of the moving parts is very much slower than in any other instrument, thus insuring lasting adjustments and durability.

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We also make an instrument (our No. 3 model) to record the mileage and running hours of Commercial Vehicles, the price of which is $35.00. Every wagon should be equipped with one of these.

If interested in the construction of this wonderful instrument, send for full particulars.

Shipman Instrument Company

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Automobile
Cylinder
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OLD CUSTOMERS STAY BY YOU if you conduct your business along these lines, and if your business depends on new customers only, it will never become profitable. If you sell whatever you can buy cheapest, simply because you are thus able to make low quotations or a larger profit, your "repeat orders" are going to suffer. *You* know that.

PANHARD OIL SALES HAVE GROWN immensely in the face of cut-price methods, cheap competition and substitution, simply because we have been steadfast in our determination to sell only the best lubricants obtainable for automobile purposes. There is a tremendous class of car owners who realize the importance of the highest quality of cylinder oil, and it is from this class that our customers come. Once they do use PANHARD they keep on, too.

WE CAN HELP YOUR OTHER LINES by turning over to you inquiries from consumers who write in to us. We are doing it constantly for our dealers. Only the other day a garage man told us that he had sold over $200.00 worth of supplies to a new customer whose name we had sent him as being interested in PANHARD OIL. This sort of help means a lot to you, if you simply will take the trouble to follow up the prospects.

WHEN YOU COME TO THE SHOWS, don't decide the oil question for next year until you have talked with us. Don't rely on what the other fellow may tell you about us; he is trying to sell you something else. We KNOW that a stock of PANHARD OIL is going to increase your business and all we want is a chance to tell you how. If you have already handled it, you know that every customer comes back for more. They don't go shopping around to find something better, and when they do come back, you get their other business too. Isn't it reasonable ?

WRITE TO US NOW, ANYWAY, for prices and advertising matter. You will find them interesting.

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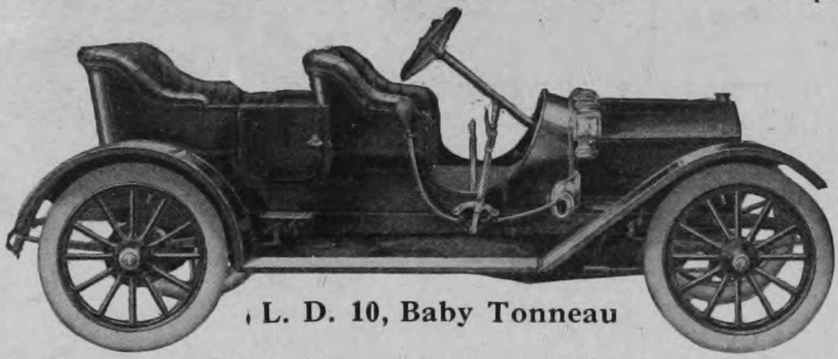
Unslighted Quality Reasonable Price

For 1910, as always before, a car of uncompromised quality such as has been demonstrated by the "stand-up" records of thousands of cars in use. ¶ Yet for 1910 an emphatically improved car and an assortment of models with a wider range in horse-power, price and capacity. ¶ On 1910 models upper halves of ¾ elliptic springs are fastened integrally to rear end of frames, and are practically an integral part of frame, which, with the increased wheel base, and lowerings of frame, produces a car of sturdy rigidity, at the same time increasing comfort and decreasing tire wear, and general wear by minimizing side jolts, adding also to the rakish, classy and aristocratic appearance of the car.

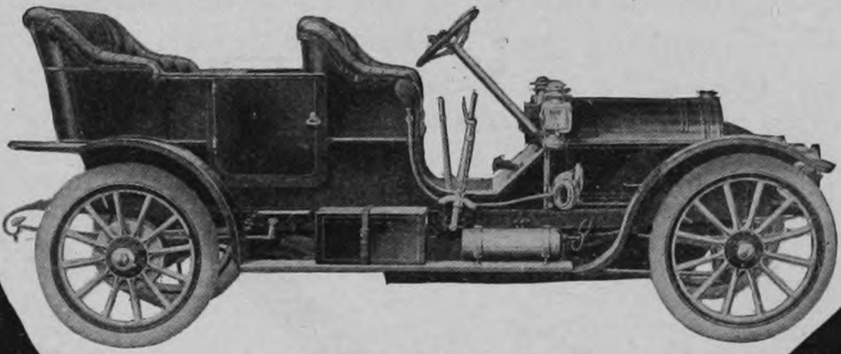
MODEL L. D. 10

Touring Car, $1500.00 Baby Tonneau, $1500.00 Coupe, $2000.00



L. D. 10, Baby Tonneau

4-cylinder, 30 H. P. 2, 4 and 5 passengers 112-inch wheel base
Remy magneto and dry cells Selective type transmission 3 speeds forward and reverse
Dropped Frame 34 x 4 inch wheels.



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Touring Car

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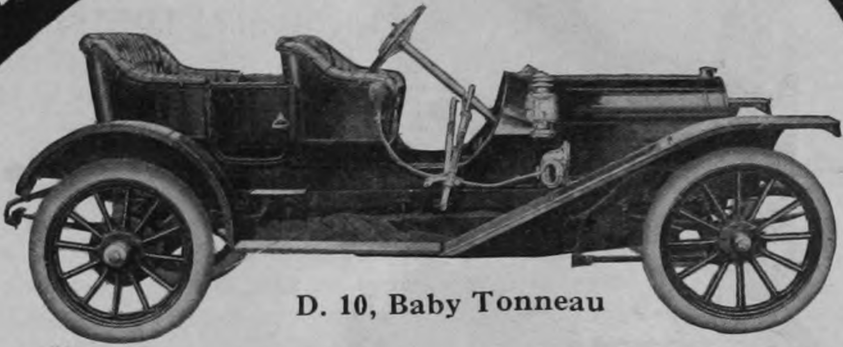
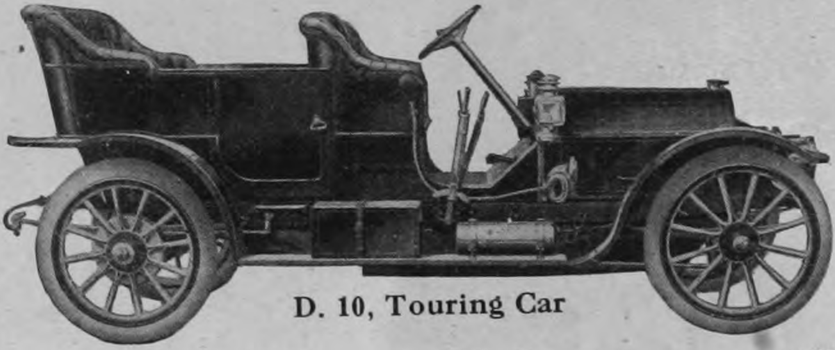

D. 10, Baby Tonneau


D. 10, Touring Car

Touring Car	$2000.00	Baby Tonneau	$2000.00
Coupe	$2500.00	Limousine	$3200.00

4-cylinder, 50 H. P. 120-inch wheel base Selective type transmission
4 speeds forward and reverse Dropped frame Remy magneto
5 and 7 passengers 36-inch wheels

Transmission on 1910 cars will be ball bearing throughout—four speeds forward and reverse, with direct drive on third speed and with fourth speed geared up about 25 per cent. above motor, reverse idler at rest when not in reverse. ¶ Double internal brakes of high power will be used for 1910, instead of internal and external; magneto and water pump shifted to opposite side of motor, leaving valves easily accessible. Chrome Vanadium heat-treated steel used in all forgings.

Kissel Motor Car Co.
Hartford, Wis.

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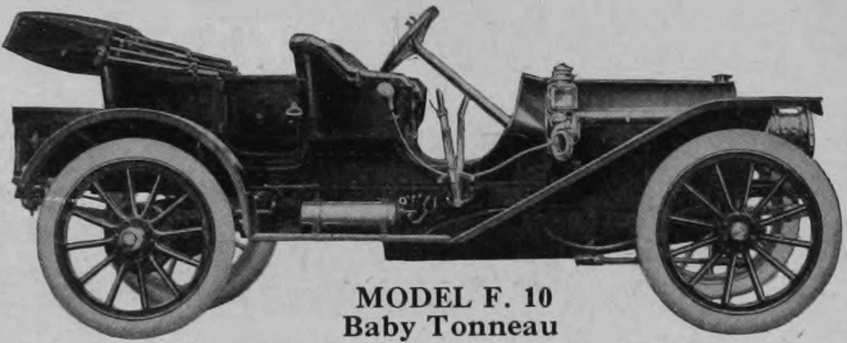
KISSEL

Beyond all doubt, Kissel Kars for 1910 represent the highest type of automobile construction, offering an assortment of cars any one of which can be purchased with the assurance that in appearance, economy and actual motoring ability, it will far surpass cars selling at the same prices, completely equalling the most expensive American and foreign cars. Reasonable in price—uncompromised in quality—that's the distinctive fact about Kissel Kars.



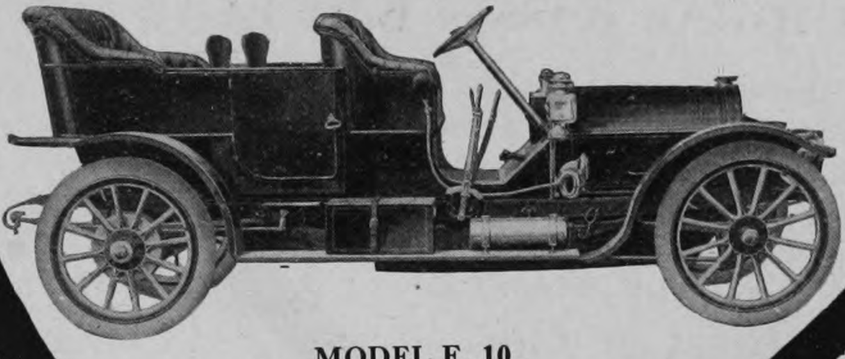
MODEL F. 10
Baby Tonneau

MODEL F. 10

Touring Car	$2500.00	Baby Tonneau	$2500.00
Coupe	$3000.00	Limousine	$3700.00

4-cylinder 50 H. P. 7 passengers

DROPPED FRAME
WHEEL BASE: 124 inches
SELECTIVE TYPE TRANSMISSION: 4 speeds forward and reverse, foot accelerator
BOSCH MAGNETO
ATWATER KENT GENERATOR
WHEELS 36 x 4 regular, 40 inches on Baby Tonneau



MODEL F. 10
Touring Car

AR

1910

MODEL G. 10

G. 10, Touring Car

G. 10, Baby Tonneau

Touring Car - - -	$3000.00	Baby Tonneau - -	$3000.00
Coupe - - -	$3600.00	Limousine - - -	$4200.00

6-cylinder, 60 H. P. Wheel base, 132 inches 7 passengers
Selective type transmission, four speeds forward and reverse, foot accelerator
Dropped Frame
Wheels, 36 x 4½ inches rear, 36 x 4 inches front, 40 inches on Baby Tonneau
Bosch magneto and Atwater-Kent generator

The Complete Kissel Kar Line

includes cars of every desirable size and body, with prices ranging accordingly. You will find in the line a car of the right horse-power, size and style to meet any average need. Write for catalog and name of representative who will give you a demonstration.

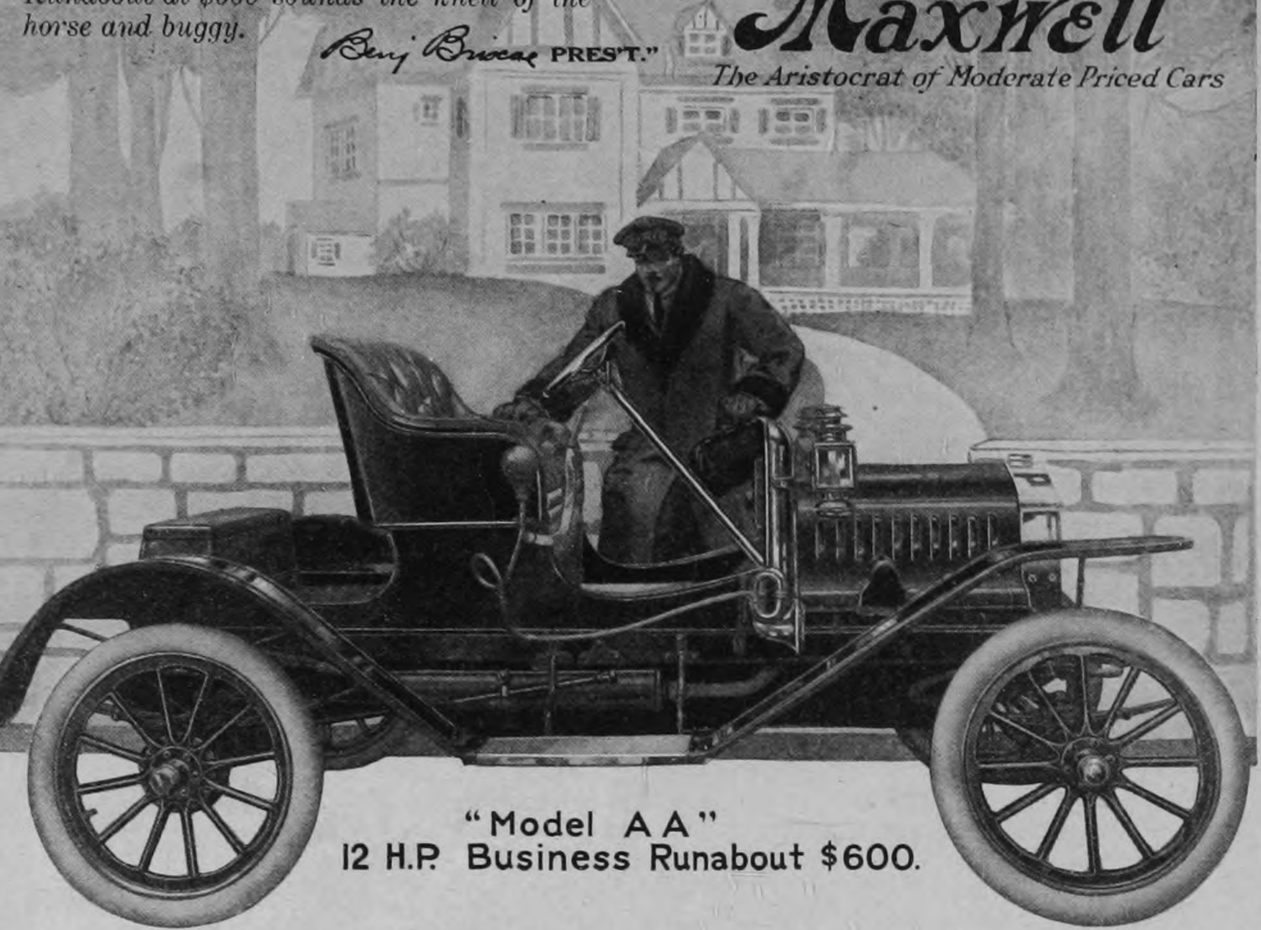
Kissel Motor Car Co.
120 Kissel Ave., Hartford, Wis.

horse and buggy.

Benj Briscoe PRES'T."

Maxwell

The Aristocrat of Moderate Priced Cars



"Model AA"
12 H.P. Business Runabout $600.

Here It Is An Automobile Within the Reach of all—$600

The car for which the World has waited. A high-grade, eliable business runabout. Costs less to keep than a horse and uggy—does the work of three.

When not in use expenses stop. A horse eats all the time —this MAXWELL is vastly more economical.

ALE OF MAXWELL CARS TO DATE

SOLD TO OCTOBER 30, '09 . .	19,391
SOLD DURING NOVEMBER, '09 .	526

MAXWELL-BRISCOE

Main Office
DALE STREET

"Maxwell"

Perfectly Simple—Simply Perfect

Good-By

Horse and Buggy

BUY NOW Don't wait. No more practical automobile can be built. Everyone should own this car, because it fills the universal need. As easy to drive as an electric. Your wife, daughter or son can run this MAXWELL and care for it—a chauffeur is unnecessary. For errands, shopping, calls, meeting trains, taking the children to school, for business or pleasure, this automobile is the gateway to outdoors and health. Picture yourself in it—*how would you use it?*

TREMENDOUS ECONOMY Because it is light. That's why the tires wear so long. 7,000 miles is not an extraordinary record for a set of tires on this car, —neither is 30 miles on one gallon of gasoline. Economical because we furnish a high-grade magneto—no expense for dry batteries. MAXWELL automobiles have a reputation for economy. Mr. J. D. Maxwell designed this one. It is the accumulative experience of his life's work; of his ambition to build a car that everyone can afford to own. Economical because it is built the MAXWELL way—the product of five great factories, and $2,000,000 of equipment. Only by building in enormous quantities is it possible to produce such an automobile for $600.

READ THIS LETTER

Allendale, N. J., September 15, 1909.

Maxwell-Briscoe-Motor Co.:

Gentlemen—Up to six weeks ago I had been driving a horse to the station, four miles morning and evening, daily.

My business had grown until time became a problem, and a friend of mine, who owns three machines, said—"Get a Maxwell, and it will solve the question."

It might interest you to know your machine has cut the time down to one-third, and aside of this, have had more pleasure and seen more country than with my horse in three years.

Yours very truly, *GEORGE B. RICHARDSON.*

WE ALSO MAKE Our Model "E," 4-cylinder, 30 horse-power 5-passenger touring car, offers for $1,500 the most in comfort, style and luxury. Our Model "Q," 4-cylinder, 22 horse-power runabout is the greatest value in its class. Price, $900, supplied also as 4-passenger touring car, $1,000.

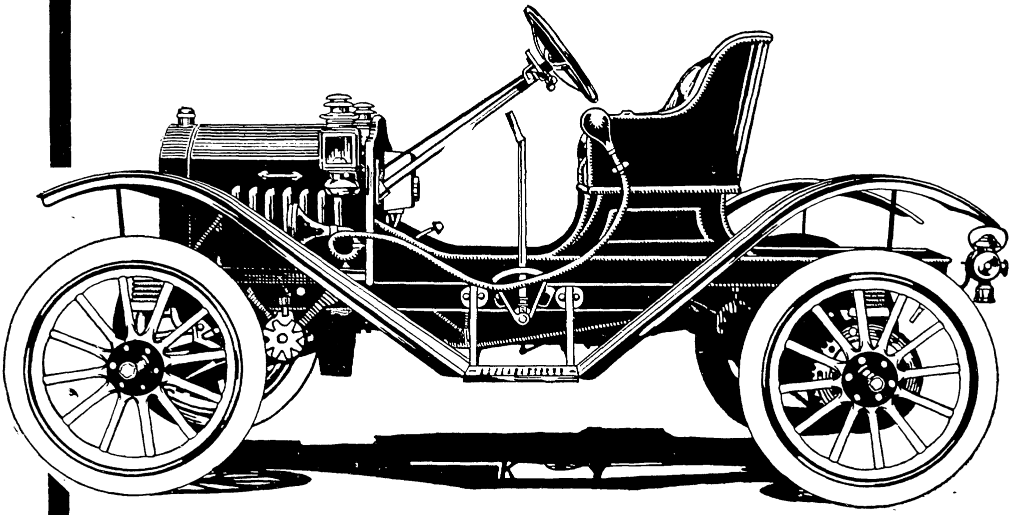
ORDER NOW There are sold each year in the United States over 650,000 wagons of the buggy type. Every horse driver needs this new runabout to economize. Here's the point. We can build but 10,000 of these cars. There will be not enough to go round. Send for our new catalog. Also, "How to Judge an Automobile," a practical treatise on motor cars, and the "Co-Operator," the newsiest Auto paper—all free—just say "mail books."

MOTOR COMPANY
and Factory
TARRYTOWN, N. Y.
Selden Patent)

OTHER MAXWELL FACTORIES

New Castle, Ind.
Providence, R. I.
Pawtucket, R. I.
Kingsland Point, N. Y.

Everyman's



Think of it---$485 for the best-built, most thoroughly proven, easiest riding, most economical, handiest small automobile in the world!

The New Brush Runabout not only outclasses all small cars, but is far ahead of its own previous high standard.

Even though we have learned the lessons all manufacturers have to learn by experience—even though we have manufacturing facilities as nearly perfect as money and brains can make them—still we could not build a car of the quality of the 1910 Brush if we merely imitated the big cars with all their complicated parts and all parts necessarily smaller and weaker.

Here's where the genius of the designer counts.

The Brush has always been and still is the only real Runabout built in America.

The new 1910 Brush is not a designer's dream but the result of years of experience and a knowledge acquired by manufacturing 3,000 Brushes that are in daily use. It is a car which with one chassis adapts itself perfectly by change of bodies to a hundred different uses.

It is a car new in power, smoothness, speed and looks, but built on proven principles by an organization already perfected.

The Brush has the fewest possible parts, but they are of sufficient size and strength to stand the hardest knocks.

Simplicity makes it possible to build the car right and still sell it at this wonderful price.

As for reliability, there is no comparison between the Brush and any of the small imitations of larger multi-cylinder cars.

With the new Brush you get single-cylinder simplicity, reliability, light weight, low gasoline and oil consumption, low tire expense with four-cylinder power and smoothness.

Its new balanced motor runs as quietly as a four-cylinder and is as flexible. Its power is astonishing.

The most wonderful improvement in Motor Car Construction in years.

While the balanced motor is the most remarkable feature of the 1910 Brush, we have made numerous other improvements and refinements.

Here are some of them: wheel-base lengthened 6 inches; more graceful and rakish lines; Mercedes type radiator; new selective control; universal coupling-shaft; improved dust-proof commutator; multiple disc low and reverse clutches; transmission control levers entirely housed and oil-tight; more quiet muffler.

In our magnificent new plant we make every part of the Brush except the wheels, tires and electric equipment. The Brush buyer pays no middleman's or parts-maker's profit.

Car at Last

1910 BRUSH

$485.00

Read the Specifications

Motor—10 Horse Power, *balanced* single cylinder, our-cycle, vertical, 4" x 5", water-cooled; located in front under hood; every part instantly accessible; three point suspension.

Balancing—After balancing by the usual counterweights, one extra loaded balance gear, driven by a crankshaft gear, is applied, the result of which is to take out *all* of the vibration due to reciprocating weight and in addition *most* (or at times *all*) of the torque vibration—theoretically *in better balance than a four-cylinder motor.*

Transmission—Internal gear type, perfectly quiet; entirely enclosed and absolutely oil-tight.

Cooling—Mercedes type radiator, on Briscoe thermo syphon system, eliminating pump.

Drive—Double side chains to rear wheels.

Control—Single hand-lever of selective action for all speeds; spark and throttle under steering-wheel; foot-pedal releases clutch without touching the hand-lever, and also applies the brake. This clutch released by the foot is one of the fine features of the Brush and is found on no other low-priced car.

Steering Gear—Another exceptional feature; internal reducing spur gear, slow and powerful at straight-ahead and accelerating as the wheel turns, entirely enclosed and oil-tight.

Axles and Frames—Oil-treated, selected wood, oak, hickory and maple; wonderful for strength, durability and lightness.

Springs—Spiral, located at extreme four corners; absolutely the easiest riding springs on any car and mechanically impossible to break.

Brakes—Internal expanding in rear sprocket hubs.

Wheels—Artillery, with 28" x 3" pneumatic tires.

Wheel Base—80 inches.

Tread—56". For Southern trade 60".

Equipment—Tools, tire kit, 3 oil lamps, horn.

Color—Maroon, except coupe.

Body—Divided seat; trimmed in high-grade leather. Platform on rear, as pictured on opposite page, with equipment, $485.00.

Six special bodies, furnished on order, at extra prices, as follows: rear platform with steel tool box; rear compartment with removable steel deck; single or double rumble with wooden tool box; racer type; coupe.

Speed—35 miles an hour, except racer type which has especial gearing.

MAIL THE COUPON TO-DAY

C. & A. 12

BRUSH RUNABOUT CO.,
1212 Baltimore Ave., Detroit, Mich.

Please send me a copy of the advance Brush Catalog.

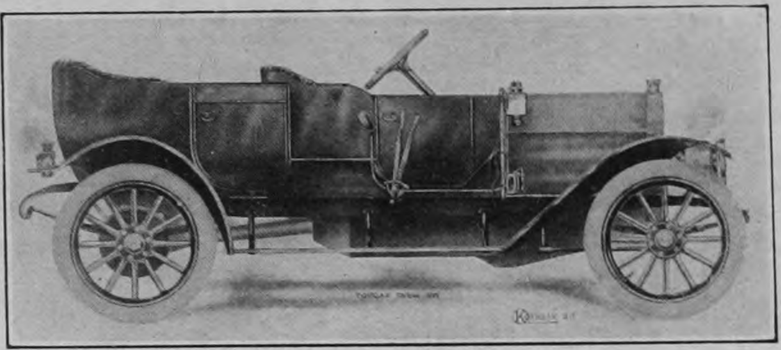
Name..
Address ....
City ....
State ....

Brush Runabout Co.

1212 Baltimore Ave.

DETROIT, MICH.

KOEHLER "40"



AT $1650.00

represents the greatest value thus far presented in the automobile business, and we think we are justified in stating that no automobile introduced this season has created such a sensation. The **"Koehler 40"** is a car developed as the result of 12 years' experience in selling automobiles, and in design, material and workmanship it is equal to cars selling for $3000 and more. The type of body known as the "Montclair" is one of the most exclusive and luxurious styles introduced for 1910. High quality and low price are combined in the **"Koehler 40,"** and it is therefore a car for the man who wants the best and full value.

DEALERS:—

We can give you the most complete and best selling line in the United States for 1910. It includes the

HUPMOBILE	**—4 cyl., 20 H. P., Runabout,**	**$ 750**
RIDER-LEWIS	**—4 cyl., 30 H. P., Touring Car,**	**$1050**
RIDER-LEWIS	**—6 cyl., 7-Passenger " "**	**$2500**
KOEHLER "40"	**—4 cyl., 5-Passenger " "**	**$1650**

We are general distributors for these cars in the following territory

Koehler "40"—United States.

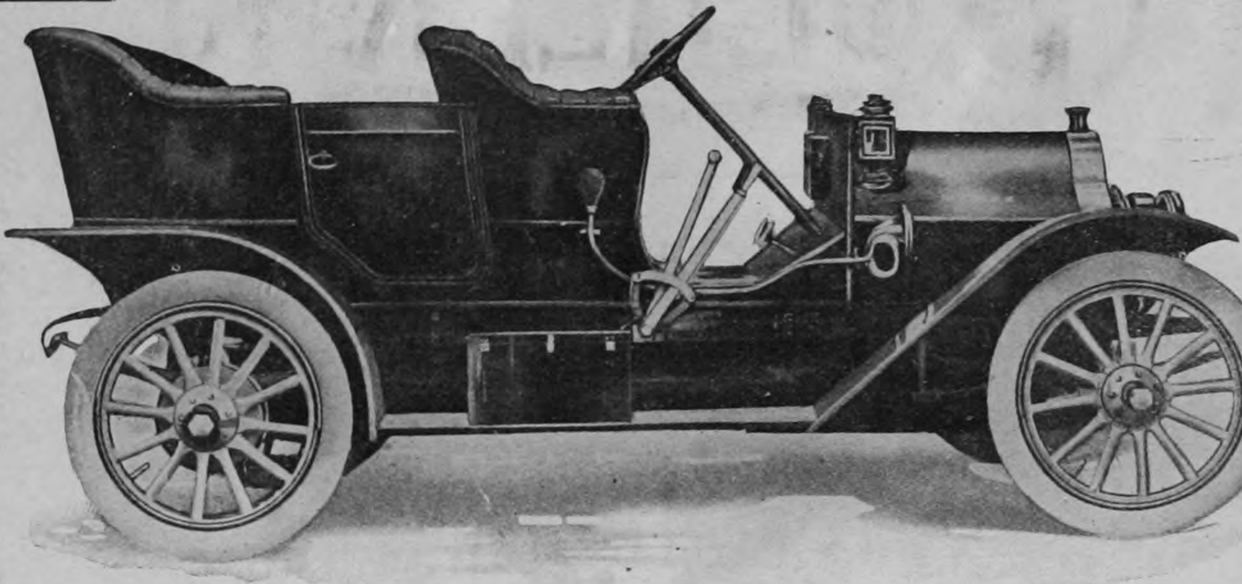
Rider-Lewis —New York, New Jersey, Pennsylvania, Delaware, Connecticut, Rhode Island, New Hampshire, Vermont, Massachusetts.

Hupmobile —New York, east of and including Rochester, North Eastern and Central Pennsylvania, Maine, New Hampshire, Vermont, Massachusetts and Connecticut.

Write us now for agency proposition.

H. J. KOEHLER CO.

RIDER-LEWIS



Type IV Touring Car

THIS IS THE CAR

¶ The new RIDER-LEWIS TYPE IV car is out and creating a furor among agents.

¶ If you have not seen it get in line at once and secure the address of our nearest distributor.

¶ Nothing like it has been seen for a decade.

¶ Marks the era of the popular priced four cylinder car.

¶ Handsome and dependable; an ideal family car has at last been produced for the man of moderate means.

¶ Other low priced cars are being offered, but the RIDER-LEWIS is the first real touring car at the price.

NOTE SPECIFICATIONS

MOTOR:	4 cylinder, 30 Horse Power, cast en-bloc, 4″ x 4½″.
VALVES:	Overhead valves, extra large.
COOLING:	Thermo-syphon system of ample proportions.
CONTROL:	Pedal controls clutch; selective gear shift; spark and throttle quadrants on wheel.
SPRINGS:	Semi and scroll elliptic.
FRONT AXLE:	Latest design "I" beam.
REAR AXLE:	Three-speed selective transmission integral.
WEIGHT:	About 1700 lbs.
PRICE:	Lamp equipment and Remy Magneto

$1050 f. o. b. Anderson, Ind.

Rider-Lewis Motor Car Co., Anderson, Ind.

Robert Burman, winner of the 100-mile race at New Orleans, 100-mile race at Columbus and other big contests in Buick, equipped with Remy. He is shown driving at 80 miles an hour.

"Remy Magneto the Greatest Made"

—Robert Burman

Lowell, September 6, 1909.

Remy Electric Company,
Anderson, Indiana.

Gentlemen:

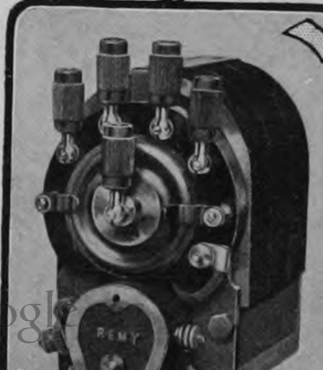
I won the 212-mile race at Lowell to-day with a REMY Magneto, and, as usual, did not know what a moment's ignition trouble was. Besides winning the race, I also covered the fastest lap of the day, doing the ten and six-tenths miles in ten minutes and twelve seconds, conclusively proving that the REMY Magneto is the greatest magneto made at high as well as low speed. I cheerfully recommend REMY Magnetos to all drivers of automobiles.

Yours respectfully,
(Signed) ROBERT BURMAN.

Over 100,000 Remy Magnetos Sold for 1910

Not one quantity user who helped make our immense 1909 season has failed to adopt the REMY for 1910. Besides—many manufacturers have adopted the REMY for 1910 who formerly used other magnetos.

Our factory is the largest and best equipped plant in the world devoted exclusively to magneto manufacturing.

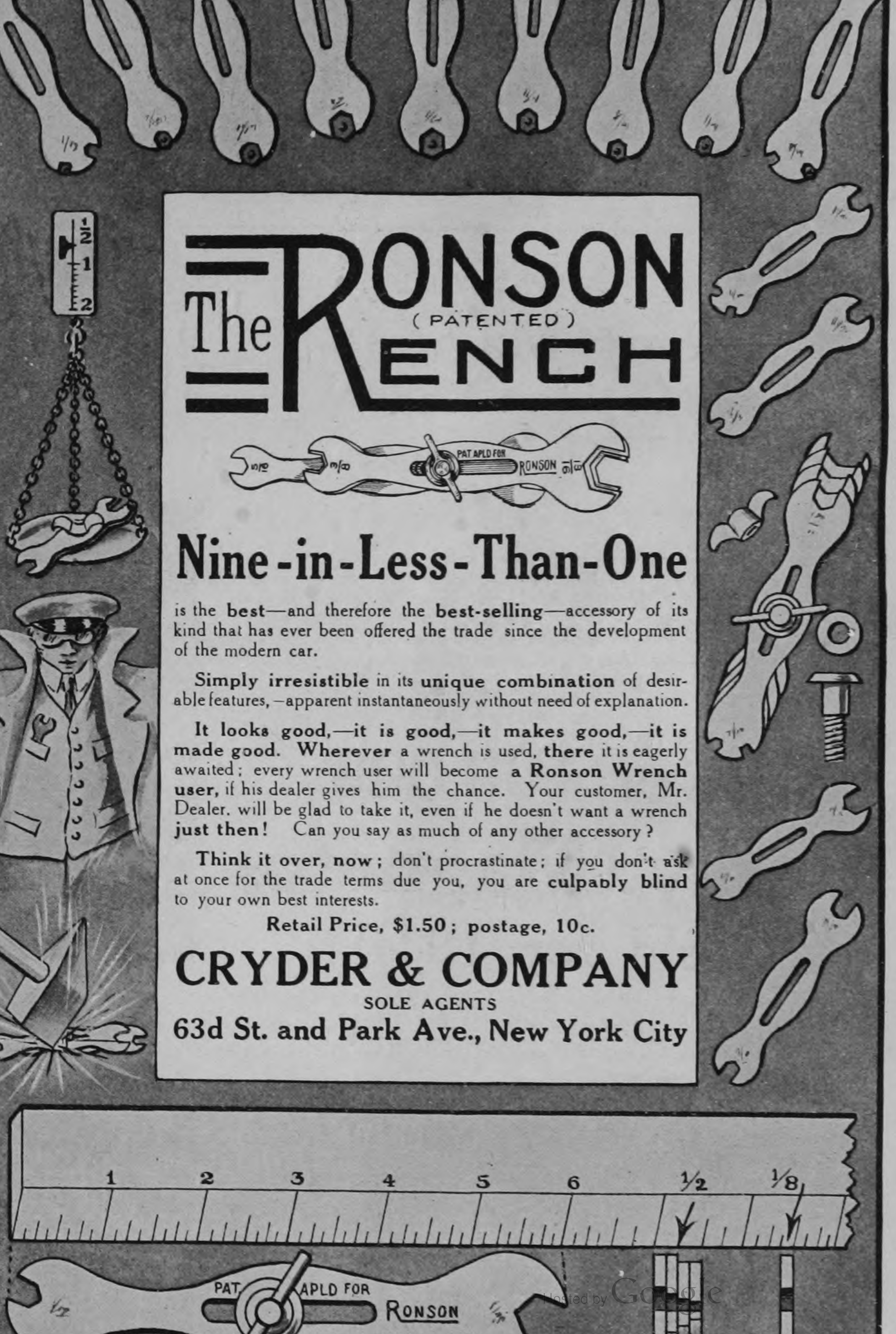


Remy Electric Company
Dept. 13
Anderson, Indiana

BRANCH DISTRIBUTING OFFICES:

1400-1402 Michigan Avenue
CHICAGO

Automobile Bldg., 64th St. and Broadway
NEW YORK CITY



The RONSON (PATENTED) RENCH

Nine-in-Less-Than-One

is the **best**—and therefore the **best-selling**—accessory of its kind that has ever been offered the trade since the development of the modern car.

Simply irresistible in its **unique combination** of desirable features,—apparent instantaneously without need of explanation.

It looks good,—it is good,—it makes good,—it is made good. Wherever a wrench is used, **there** it is eagerly awaited; every wrench user will become **a Ronson Wrench user,** if his dealer gives him the chance. Your customer, Mr. Dealer, will be glad to take it, even if he doesn't want a wrench **just then!** Can you say as much of any other accessory?

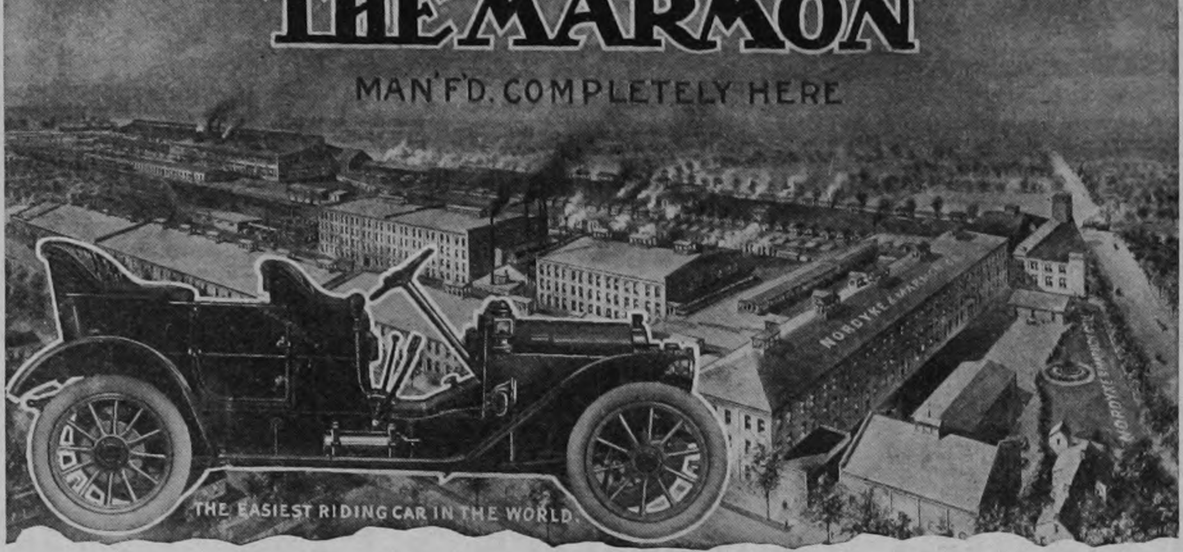
Think it over, now; don't procrastinate; if you don't ask at once for the trade terms due you, you are **culpably blind** to your own best interests.

Retail Price, $1.50; postage, 10c.

CRYDER & COMPANY

SOLE AGENTS

63d St. and Park Ave., New York City



Has Amazed Motordom By Its Long Non-Stop Mile-a-Minute Runs

Mile-a-minute speed is a terrible strain on a car. Few cars keep it up for even 25 miles without a stop.

Do you know of any stock car, except the Marmon, that can go 190 miles at a mile a minute, without a stop?

The Marmon "Thirty-two" (Harroun driving) did it when it won the Wheatley Trophy in the Vanderbilt.

Do you know of any stock car, except the Marmon, that can go 120 miles in 109 minutes, without a stop?

The Marmon "Thirty-two" (Harroun driving) did it when it won the 120-Mile Stock Chassis Race at Atlanta, defeating its nearest competitor by over six miles.

Do you know of any stock car, except the Marmon, that can go 164 miles in 140 minutes, without a stop?

The Marmon "Thirty-two" (Stillman driving) did it in the 200-Mile Race at Atlanta. After going this distance, the car plunged off the track when a tire burst, while running 72 miles per hour. The wheels were smashed, but the car showed no other injury.

Three days later, this same car was a close third in the 50-mile Free-for-all.

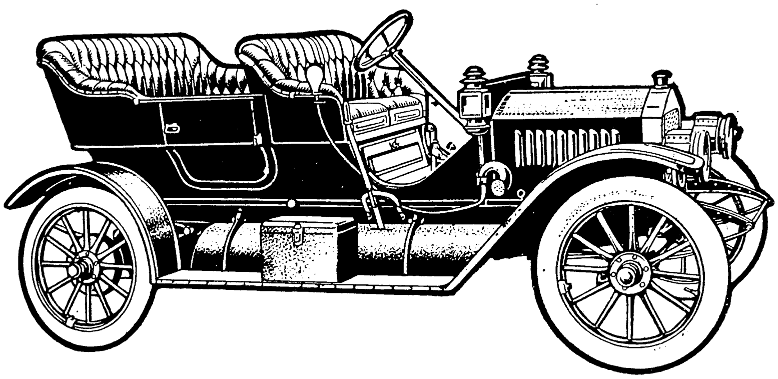
Stamina of this sort cannot be had in any other car, regardless of price.

The STABILITY of Marmon stock cars has been proven by every known test, public and private.

Decidedly, the safe choice for the buyer who seeks lasting satisfaction and absolute certainty of service.

The "Thirty-two" { *32-40 H. P. Weight, 2300 lbs. Complete, high-grade equipment* } **$2650**

Nordyke & Marmon Co. (Estab. 1851), **Indianapolis, Ind.**



5 LAMBERT MODELS FOR 1910

$900---$975---$1200---$1275---$1700

All popular prices.

All cars of style, snap and excellent workmanship.

All equipped with the friction-drive—made popular by the well-known running qualities of Lambert cars.

These cars will be among the easiest sellers during the 1910 season.

Inquiries for our agent's proposition requested from **good, live dealers** everywhere.

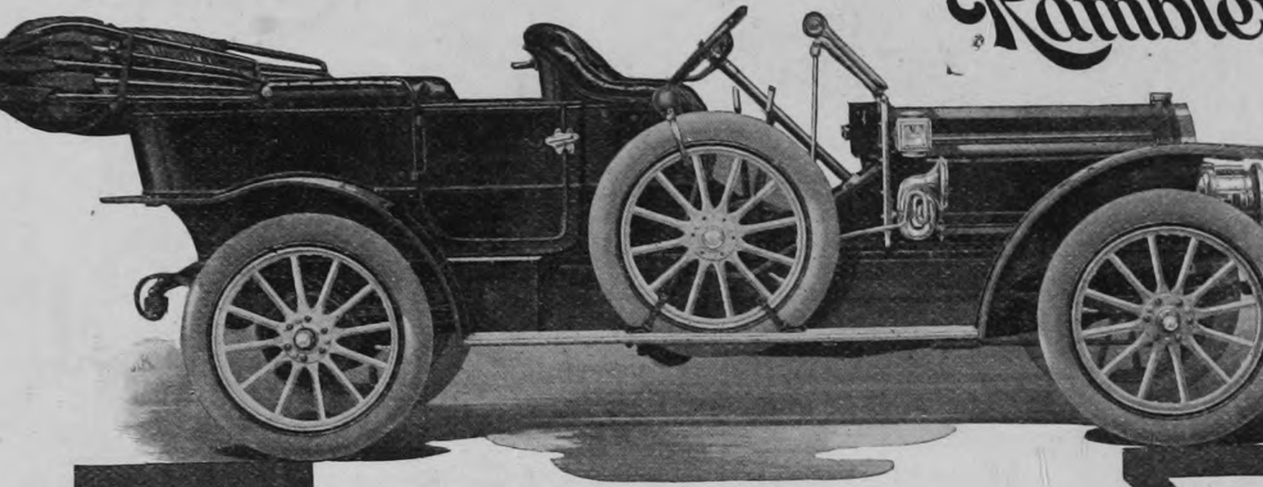
SPECIFICATIONS OF MODEL 36

CAPACITY—Five passengers.
WHEEL BASE—110 inches.
TREAD—56 inches.
WHEELS—32-inch. wood artillery.
TIRES—32 x 3½ inch, quick detachable.
MOTOR—4-cylinder, 35 horse power, with fan attached and cylinders cast en bloc.
CYLINDERS—4⅛-inch bore ; 4½-inch stroke.
TRANSMISSION—Friction.
SPEED—1 to 45 miles per hour.
CARBURETOR—Float feed.
IGNITION—High tension magneto, dual system.
RADIATOR—Round tube type.
DRIVE—Single silent chain enclosed in dust-tight metal case.
BRAKE—Internal expansion brake in each rear hub; drums 12 inches in diameter.
BEARINGS—Standard ball bearings on front wheels; Hyatt bearings in rear axle.
CLEARANCE—10½ inches.
GASOLINE CAPACITY—15 gallons.
LENGTH OF BODY FROM INSIDE OF DASH—91 inches.
WIDTH OF BODY—33 inches.
WIDTH OF FRONT SEAT—42½ inches.
WIDTH OF REAR SEAT—52 inches.
PAINTING—Body, deep red, English Vermillion stripe on panel, black moulding; chassis, deep red striped with English Vermillion.
UPHOLSTERING—Fine quality of leather.
WEIGHT—1700 pounds.
EQUIPMENT—Two gas lamps, generator, tail lamp and two oil side lamps, 40-inch flexible tube horn and full tool equipment, including jack. Body ironed for top.
Wilkinson (Mech.) Self-Starting Device will be attached to this car, $50 extra.
PRICE—$1275.00, f. o. b. factory. Top, extra.

BUCKEYE MFG. COMPANY

1801 Columbus Ave., Anderson, Indiana

THE NEW
Ramble



Model Fifty-five, 45 H. P., $2,500, with Magneto, Lamps, Presto Tank and Tools.

THE new Rambler is better than any previous Rambler in quality, dignity, silence and comfort, and in many respects it is superior to any other automobile; built in three models: Fifty-five, seven-passenger, forty-five horsepower, $2,500; Fifty-four, five-passenger, forty-five horsepower, $2,250; and Fifty-three, thirty-four horsepower, $1,800; magnetos included.

Model Fifty-five

Capacity: Seven-passenger.
Engine: Four cylinder, 5 x 5½.
Wheel-base: 123 inches.
Wheels and tires: 36 in. x 4½ in.
Spare wheel, with tire, brackets and tools, $100.
Top and Rambler wind-shield, $150.

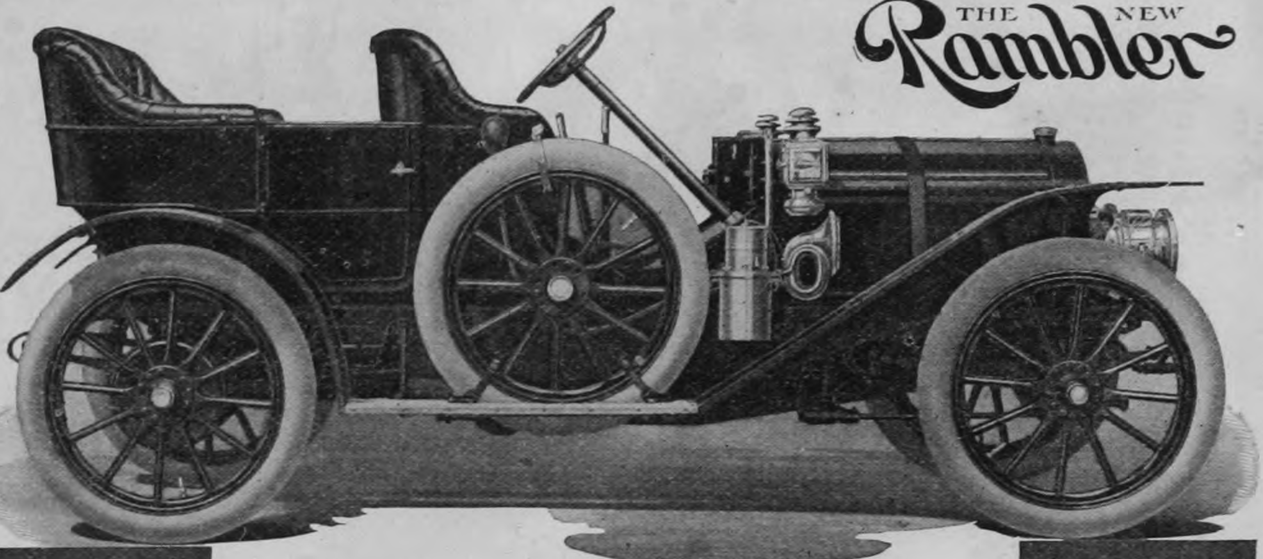
Equipment: Magneto, 6-80 storage battery, two gas head-lamps, electric side-lamps, combination electric and oil tail-lamp, Presto-lite tank, adjustable foot-rest and robe-rail, horn, jack and tools.
Color: Light Brewster green, striped pea green, with cream wheels.

Thomas B. Jeffery & Company
Main Office and Factory, Kenosha, Wis.

Branches and Distributing Agencies:
Chicago, Milwaukee, Boston, Cleveland, San Francisco. Representatives in all leading cities.

THE CAR OF STEADY SERVICE

THE NEW Rambler



Model Fifty-three, 34 H. P., $1,800, with Magneto, Lamps and Tools.

MODEL Fifty-three, at $1,800, except for improvements, is identical in quality and power with previous Rambler models which sold at $2,250.

Capacity: Five-passenger.
Engine: Four-cylinder, 4½ x 4½, thirty-four horsepower.
Wheel-base: 108 inches.
Spare wheel with tire, brackets and tools, $75.

Wheels and tires: 36 in. x 3½ in.
Color: Dark Brewster green body with cream wheels.
Equipment: magneto, oil side and tail-lamps, gas head lights and generator, horn, full set of tools and jack.

Model Fifty-four

Model Fifty-four, forty-five horsepower, at $2,250, except for body capacity, is practically a duplicate of Model Fifty-five.

Capacity: Five-passenger.
Engine: Four cylinder, 5 x 5½, forty-five horsepower.
Wheel-base: 117 inches.

Wheels and tires: 36 in. x 4 in.
Color: Light Brewster green and cream wheels.
Equipment: Same as Model Fifty-five.

Thomas B. Jeffery & Company

Main Office and Factory, Kenosha, Wis.

Branches and Distributing Agencies:
Chicago, Milwaukee, Boston, Cleveland, San Francisco. Representatives in all leading cities.

THE CAR OF STEADY SERVICE

A New Departure

Shaft Drive

BEVEL GEAR—ON ALL

Baker Electrics

THE ONLY SHAFT DRIVEN ELECTRICS

The Greatest Advance Ever Made in Electric Motor Cars

After many years of experimenting we have perfected a shaft drive, which excels any chain drive in efficiency, and have adopted this new transmission, because of its unquestioned superiority over every other type. This is in accordance with the practice of all high grade gasoline motor car manufacturers, both American and foreign.

We Now Present For the First Time
A COMPLETE LINE OF SHAFT DRIVEN ELECTRICS

Write for booklet giving specifications and full information regarding our many other exclusive improvements.

The Baker Motor Vehicle Co.

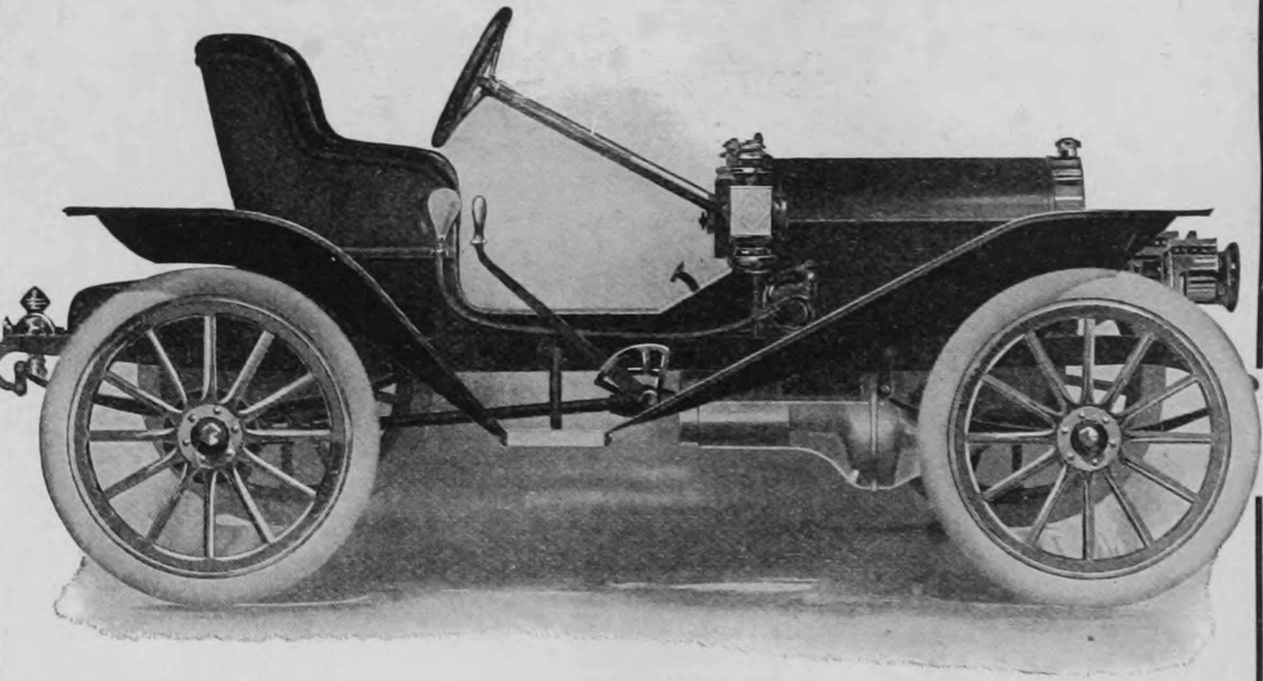
35 **West 80th Street** **CLEVELAND, OHIO**

THE OLDEST AND LARGEST MANUFACTURERS
OF ELECTRIC MOTOR CARS IN THE WORLD

HERE IT IS

"DEMōT"

All of the best features of the high-priced cars embodied in a runabout at a price within reach of all.



$550—Magneto Included

Write for Agency Proposition

DEMOTCAR SALES CO.
Distributers
45 State Street
DETROIT

Demotcar Company
Manufacturers
.. .. MICHIGAN

Wins Class Two Vanderbilt Cup Race

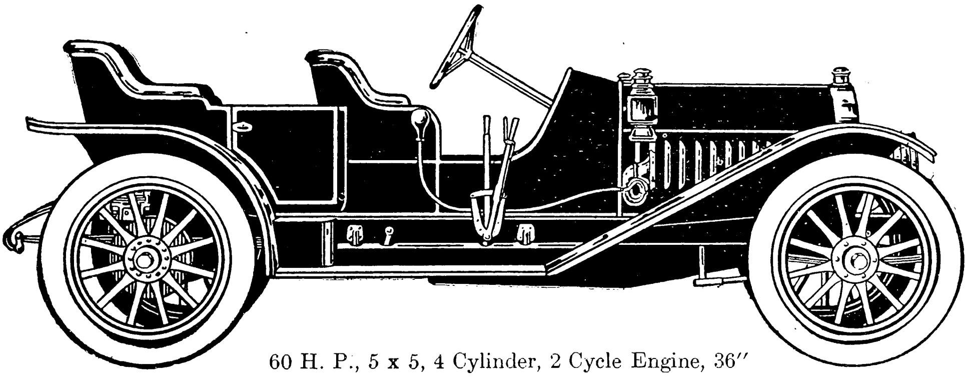
Atlas Two Cycle Atlas TWO CYCLE MOTOR CARS **Motor Cars**

The Perfected Two Cycle Engine

The most powerful and speedy two cycle car in the market and the only two cycle car ever entered in a long distance race in this country.

In the Vanderbilt Cup Race the Atlas finished fourth among fifteen starters and first in Class Two. Its fastest lap of 12.64 miles was made in 12.6 minutes, an average speed of sixty miles an hour and at the end of 100 miles was but six minutes behind the winning car.

The smooth even drive from the double impulses of the two cycle Atlas engine eliminated all engine and tire troubles which were so evident among the other contestants in the race.



60 H. P., 5 x 5, 4 Cylinder, 2 Cycle Engine, 36″ Wheels, Full Floating Type Rear Axle with Timken Bearings, I-Beam Drop Forge Front Axle with Timken Bearings, Internal Expanding Clutch, Shaft Drive, Gemmer Irreversible Steering Wheel, Atwater Kent Ignition, Brown-Lipe 3 Speed Selective Sliding Gear, Drop Frame, Aluminum Body.

Baby Tonneau,	**120-inch**	**Wheel**	**Base,**	**$2500**
5 Passenger Touring Car,	**128**	**"**	**"**	**2500**
7 " " "	**128**	**"**	**"**	**2600**

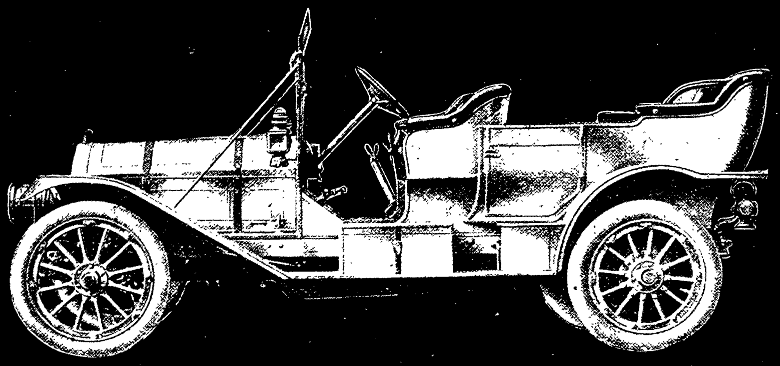
Send for Full Illustrated Catalogue and 2 Cycle Catechism

ATLAS MOTOR CAR CO., **92 BIRNIE AVENUE**
SPRINGFIELD, MASS

NEW YORK OFFICE, 1924 Broadway, F. H. Adams, Mgr.

THE PERFECTED

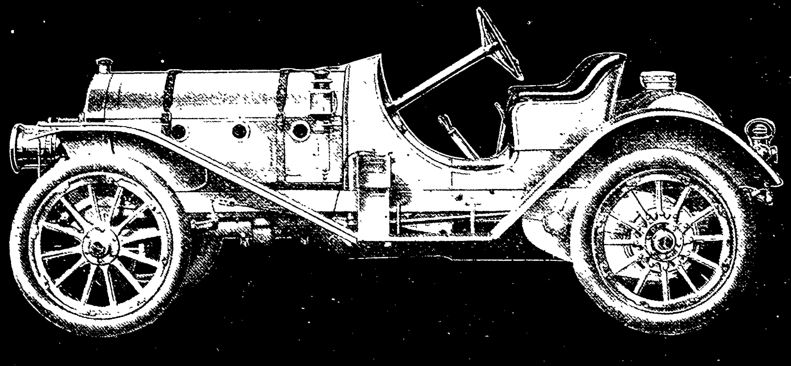
Great *Chadwick* Six



A Different and a Better Car

Will go faster or slower on the high gear than any large stock car in the world, because of perfect engine control.

Touring Cars, Guy Vaughn and
Standard Tourabouts, $5,500



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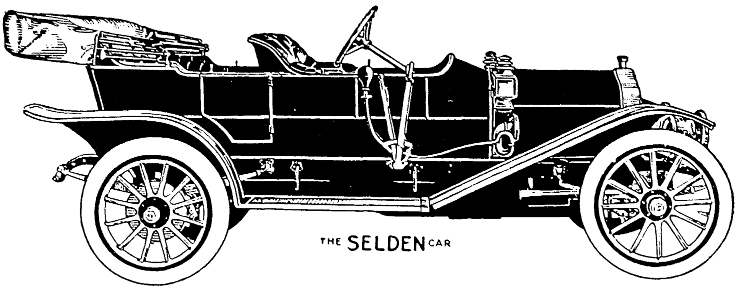

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Torpedo
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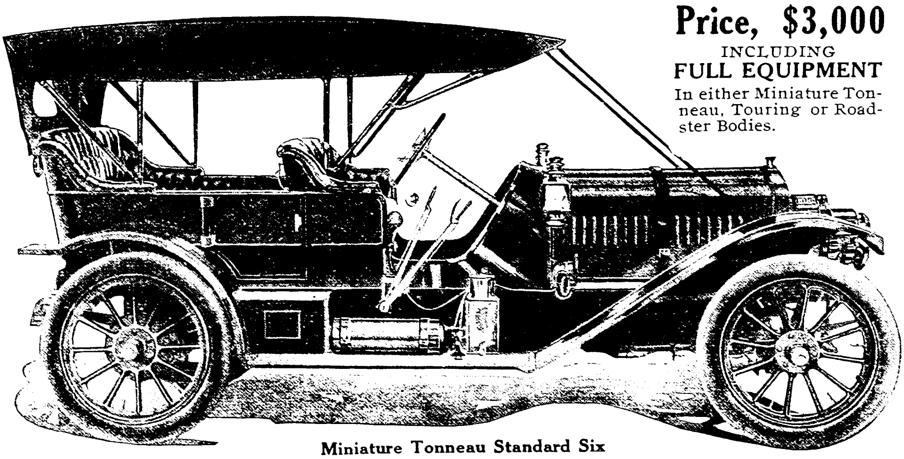

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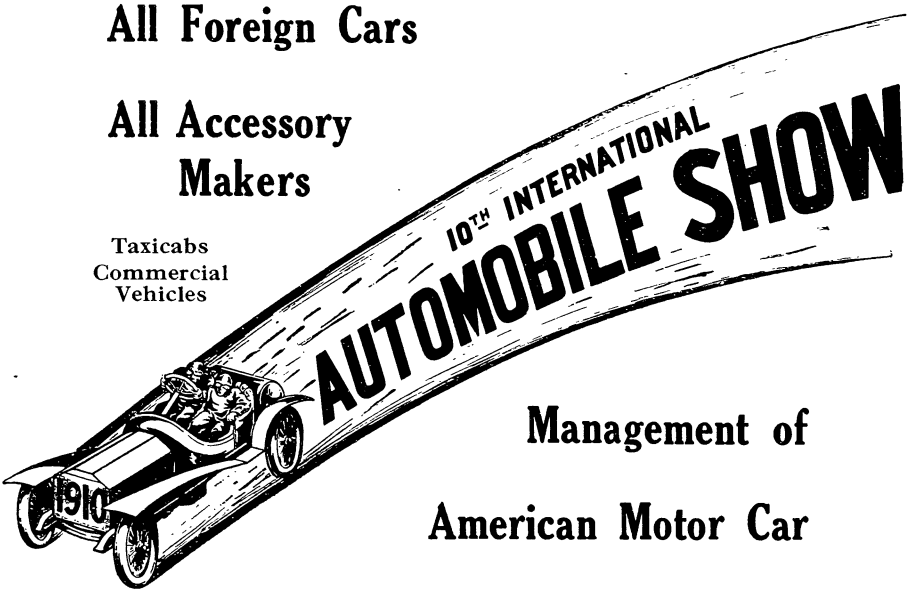

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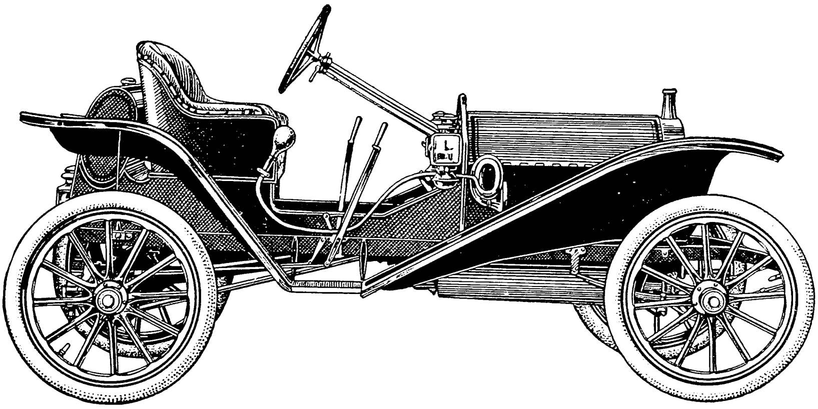


Hupmobile

4 cylinders
20 H. P.
Sliding gears
Bosch Magneto

$750 (F. O. B. Detroit)

"I want one of these Hupmobiles," says the man with the big income. "They're smart and stylish and I can jump in and skim away a dozen times a day where I wouldn't want to bother with my big car."

"I want one of those Hupmobiles," says the man with the more modest income. "They're just what I've been waiting for—a thoroughly sound piece of automobile engineering at a price that I can afford to pay."

Of these two classes who are buying them by the hundred, the first man to grasp the goodness and the soundness of the Hupmobile is the man who owns a fine big car which cost him five or maybe ten times as much money.

They see that it's the sturdy little "willing worker" of the automobile world. They see that it's full of snap, fire, vim, dash and style; and ready to leap into service in less time, as the chauffeur says, than it would take the big car to "fill its lungs with air and get ready to breathe."

The difference between the big car and the Hupmobile is just a relative difference—a difference in size but not in quality. Both are made from the same fine metals; both are the brain-children of skilled designers—the Hupmobile a long cherished ideal of E. A. Nelson, whose fine engineering ability has never lent itself to anything less worthy than cars of the highest calibre.

Fifty miles an hour is no extraordinary speed for the Hupmobile—and, it will climb any hill that the biggest automobile can climb

After you've recovered from your astonishment at the dashing appearance of the Hupmobile, your first impulse will be to look for some lack of sturdiness in the construction to account for the $750 price.

You won't find it.

If you know anything about metals, you'll see that the steels employed are the very best and finest.

If you will examine the axles, expecting them to be slight and skimpy, you'll find instead rugged strength and toughness sufficient to support twice the weight.

When you lift the hood, you'll uncover a power plant that's a perfect gem of smooth and scientific workmanship—with an offset crankshaft; all bearings made of Parson's white bronze; and a crankshaft absolutely noiseless in its operation.

When you come to the transmission, you'll find the selective sliding gear type—with gears cut from the hardest and toughest steel.

Even on the costliest cars you've heard the clash of shifting gears—but you'll listen in vain for that grinding sound on the Hupmobile.

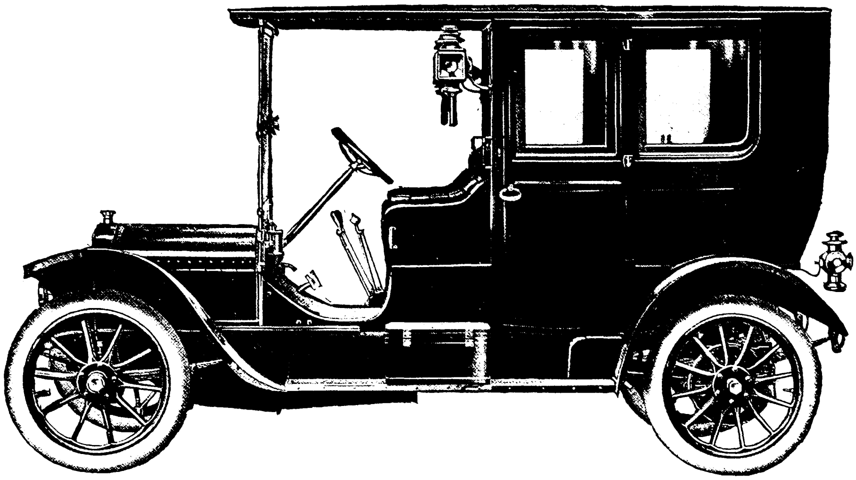
These are a few of the Hupmobile features which will send your admiration for the little car up and up by leaps and bounds when you study it in the hands of the dealer and during a demonstration.

Write for the literature and the name of the Hupmobile dealer.

Hupp Motor Car Co. (Dept. A), Detroit, Mich.

White Town Cars

For 1910



AS IN former years, we are giving considerable attention to the production of limousines and landaulets and we are now delivering these in both steam and gasoline models. Above is shown our Model "G-B" Limousine. In every detail of equipment and finish, the body represents the highest development of the body-builder's art. The five inside seats all face forward; three passengers are accommodated on the rear seat and two on folding seats. The chassis—the larger of our two gasoline models—was designed with special reference to the requirements of town car service.

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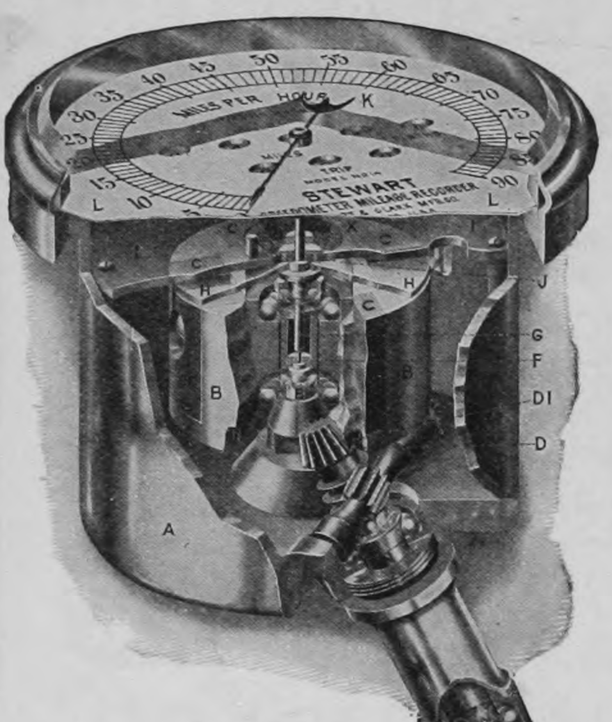
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TRIP
MILES
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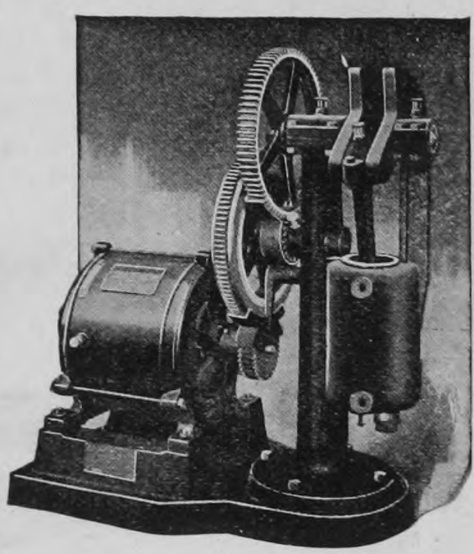

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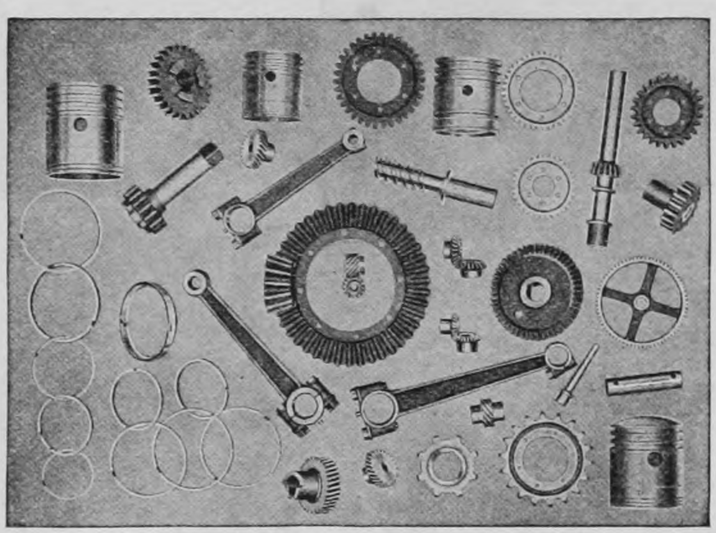

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AUTOMOBILE PARTS

Splitdorf Ignition

MAGNETO ignition is now universally admitted to be the most powerful and reliable method in vogue today. It has attained this recognition only after exhaustive tests by the leading engineers in the combustible engine field throughout America and Europe. The natural result of this proof is found in the numerous forms of Magneto ignition now on the market.

There has existed in this country an impression that the imported Magneto, being higher in price, is higher in quality.

We are producing a Magneto made by American workmen, in an American factory and at an American price that equals in every way and excels in many the workmanship and operation of anything produced in the foreign market. The fact that the Magnetos of our manufacture will operate at such a slow speed, thus enabling the user to get away from the compulsory use of battery ignition, and at the same time have a Magneto that will "stay put," proves that we have attained our object.

The additional fact that the Splitdorf Magneto is the most popular one of the day, and that the Splitdorf Ignition output for 1910 will be the largest in the world, further proves our position.

We make this assertion because we realize that the owners of automobiles and kindred interests are rapidly joining that discriminating class who demand actual proof before purchasing, whereas in the past, with but a limited knowledge of the elementary principles entering into the construction of machines of this nature, they were compelled to form their judgment more or less from plausible advertisements.

In the description of our Magneto, which we herewith present, we endeavor to explain the principles of construction and method of use in plain words so that it may be easily understood by the lay mind as well as by the experienced engineer.

That these instructions may be better understood, a simple explanation of the system employed and a line cut showing a cross section of the standard type B machine is here given.

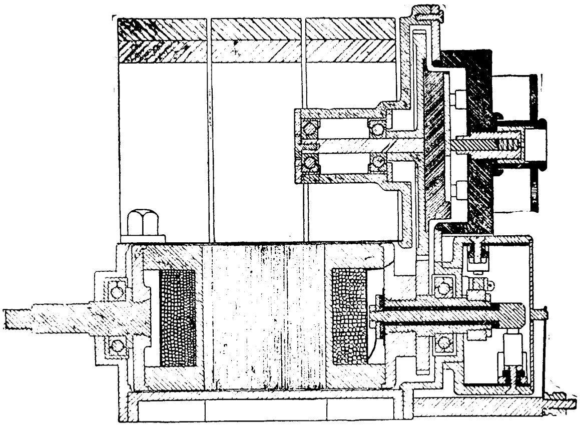


Fig. 1. Cross Section Model B Magneto.

The system used is that having an armature with but one winding and giving a current of comparatively low tension. The current is discharged through a transformer having a low and a high tension winding somewhat similar to a regular spark coil. This steps the current up to a voltage sufficiently high to enable it to jump the necessary gap between the points of a spark plug in the compressed mixture in the cylinder of the motor.

Looking at the cut of the machine one can almost take in its general construction at a glance. The plain H or shuttle armature is mounted between two annular ball bearings. One end of the shaft is the driving end and the other is equipped with the breaker cam and the insulated plug which delivers the current generated in the armature to the collector brushes from which it goes to the transformer connection.

From "A" the armature current goes through the primary of the transformer, and the circuit being broken at the proper moment a very high voltage current is induced in the secondary winding of the transformer, and being delivered to the heavily insulated cable D (see wiring diagram) is conducted to the central brush of the distributor whence it is delivered to the spark plugs in the different cylinders in correct sequence.

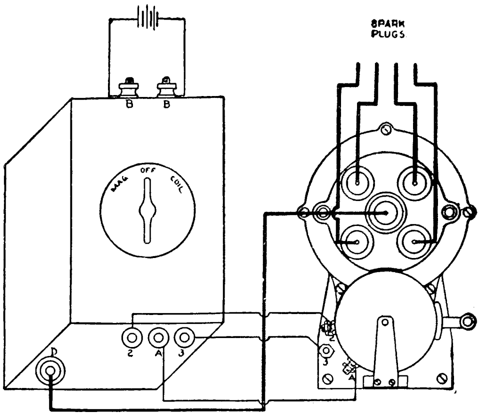


Fig. 2. Wiring Diagram for Model B and Model D Magnetos, with Non-Vibrating Dashboard Type Transformer.

In addition to using the current from the Magneto we have adapted the transformer to be used as a spark coil by using the breaker mechanism of the Magneto as a circuit breaker to interrupt a current from the battery, which can be switched in for starting purposes or for an emergency. The distributor is used to deliver the current thus generated to the spark plugs. This gives a dual system with one set of spark plugs, and the simple movement of the switch controls both systems.

A change in style of building automobiles shows a dash board free of coils and general appurtenances. To meet this condition we have devised a transformer which admits of its being strapped to the frame of the car or to the under side of the foot boards or any other convenient place out of sight. This transformer is in the form of a tube with the necessary connections grouped at one end. It is waterproof and oil proof, and is becoming a very popular piece of ignition apparatus. We show herewith a separate wiring diagram for this apparatus, and it is possible to use this new device in connection with any model that we make.

Instructions for Setting and Operating Model B.

After bolting the Magneto to the prepared base on the motor, crank it until cylinder No. 1 is exactly on its firing center (i. e., the point of greatest compression). The motor must remain in this position until the balance of the work is finished.

Retard the spark advance mechanism at the steering wheel to its limit and connect it to the spark advance lever on the breaker box of the Magneto, so that if the Magneto shaft revolves in a clockwise direction looking at the driving end, the breaker box lever will be at its topmost position. If the shaft revolves left-handed the lever should be at the bottom limit, and advanced upward.

As all four cylinder four-cycle models run at crank shaft speed it is customary to drive either geared direct to the crank shaft or by means of a universal coupling known as the "Oldham" coupling. The latter method is very much to be preferred to the former, because the accurate setting and alignment absolutely necessary with the direct gear on the armature shaft is not essential with the latter method. There is another drive possible, the chain, but on account of the many wearing points, back slack, etc., this should only be used where gear drive is impossible on account of inaccessibility, or where a large number of gears are objectionable.

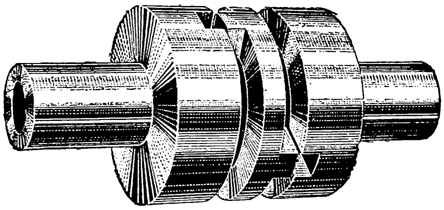


Fig. 3.

If the "Oldham" drive is employed, the driving flange is first slotted to fit the "Woodruff" key supplied with the Magneto and then fitted. The other flange of the coupling is left loose on the end of the pump shaft or other shaft used to drive the Magneto and the cross block is slid into place.

Now revolve the armature shaft in its direction of rotation until the oval breaker cam comes in contact with the roller in the breaker bar and just begins to separate the platinum contacts.

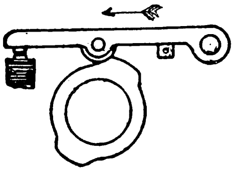


Fig. 4.

The flange of the coupling can then be drilled and reamed for a taper pin and the timing of the Magneto is then permanently effected.

Then connect the terminals on the Magneto to those on the transformer as shown in the wiring diagram.

The wires to the spark plugs in the cylinders should be "stripped" for about one-half inch and the ends pulled into the cups of the distributor, and jammed up into a little ball as illustrated.

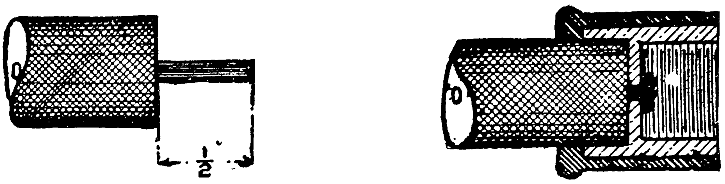


Fig. 5.

After ascertaining the position of the bronze sector of the distributor, connect the cup directly over it to the spark plug in cylinder No. 1.—Since the direction of rotation of the distributor is always opposite to that of the armature shaft, the wire from the cup next in rotation goes to the next cylinder in sequence of firing and so on until all four are connected. Four cylinder four cycle motors always fire either 1 2 4 3 or 1 3 4 2, the latter being the most general rule.

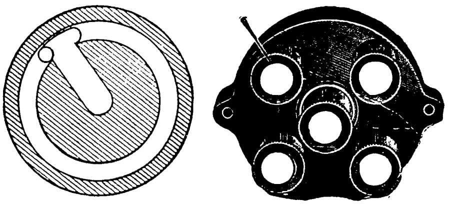


Fig. 6.

In starting the motor, always retard the spark mechanism to its limit, throw the switch on the transformer to the side marked "Battery" and crank the motor.

If it is desired to start on the Magneto side, ignoring the battery entirely, advance the spark mechanism about one-half or two-thirds of the way and crank as before. No back kick is observed. DO NOT DRIVE THE MOTOR WITH THE SPARK RETARDED, BUT AS FAR ADVANCED AS THE ENGINE WILL PERMIT.

It sometimes happens that parties ordering these Magnetos are unable to give us the direction of rotation, and we have, therefore, designed them so that by following these instructions anyone can set them to run clockwise or counter.

Thus if the breaker cam is put on with the side marked "R" out, the armature is to revolve right-handed or clockwise looking at the driven end; if the "L" mark is out, it is to run counter or left-handed.

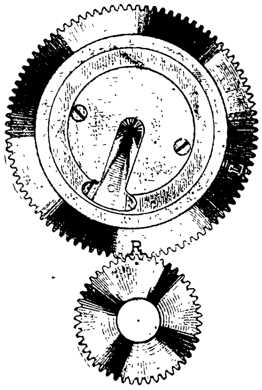


Fig. 7.

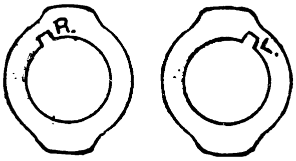


Fig. 8.

To change from one direction to the other, remove the breaker box, hold the driven end of the armature firmly with a pair of gas pliers and remove the little nut. Pull off the cam which is keyed on with a Woodruff key, turn the cam over, replace the nut and reset it on the shaft with a prick punch so that it will not jar off. Then remove the distributor block and take out the screws from the lettered ring. Remove the brass protecting cup on the distributor bearings which will be found inside the ∩ formed by the magnets and remove the top screw found underneath in the center of the distributor shaft. The distributor and its gear can then be pulled forward out of mesh.

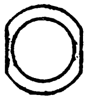


Fig. 9.

A prick punch mark will be found on the armature gear and two sets of two prick punch marks will be found on the distributor gear, one set marked "R" the other "L." The armature gear mark must slip in between the desired mark and the parts all replaced as before. The machine will then be ready to be placed in operation on the motor in the desired direction. The cam and distributor marks must be both alike, either "L" or "R."

Remember! This system absolutely requires that both poles of the battery be brought to the transformer. YOU MUST NOT GROUND THE BATTERY.

If the platinum contacts after much usage become pitted so that a bad contact results, they can be filed flat with a fine file, taking care not to file off any more than is necessary. Then reset the screw so that the break is no more than a thick piece of tin, say $^1/_{32}$ of an inch.

We manufacture a number of models suitable for different sized motors having a varied number of cylinders, and we designate them by the letters B, D, G, S, SS, L, etc.

For two cycle motors of the two and three cylinder sizes our standard B, D, S and SS Magnetos, with a slight change in the distributor device, are supplied and designated, as follows: For two cylinder two cycle Model D Special and Model B Special, for three cylinder two cycle Model S Special and Model SS Special, depending on the size of the engines and the amount of space available to attach same. These Magnetos sell for the same price as our standard Models. Wiring diagrams furnished on request.

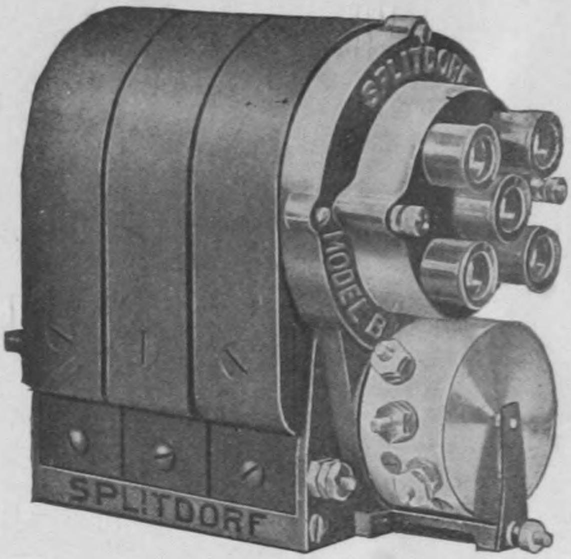

SPLITDORF
MODEL B
SPLITDORF

Fig. 10. Model B.

The standard type for heavy slow moving four cylinder four cycle motors. It has six magnets in three pairs, and is equipped with either the plain non-vibrating transformer or with one of our noted synchronized vibrators which operates when the switch is turned in the indicated direction. The vibrator type necessitates an extra lead and insulated breaker blade, equipped with platinum points, which is operated by the breaker bar.

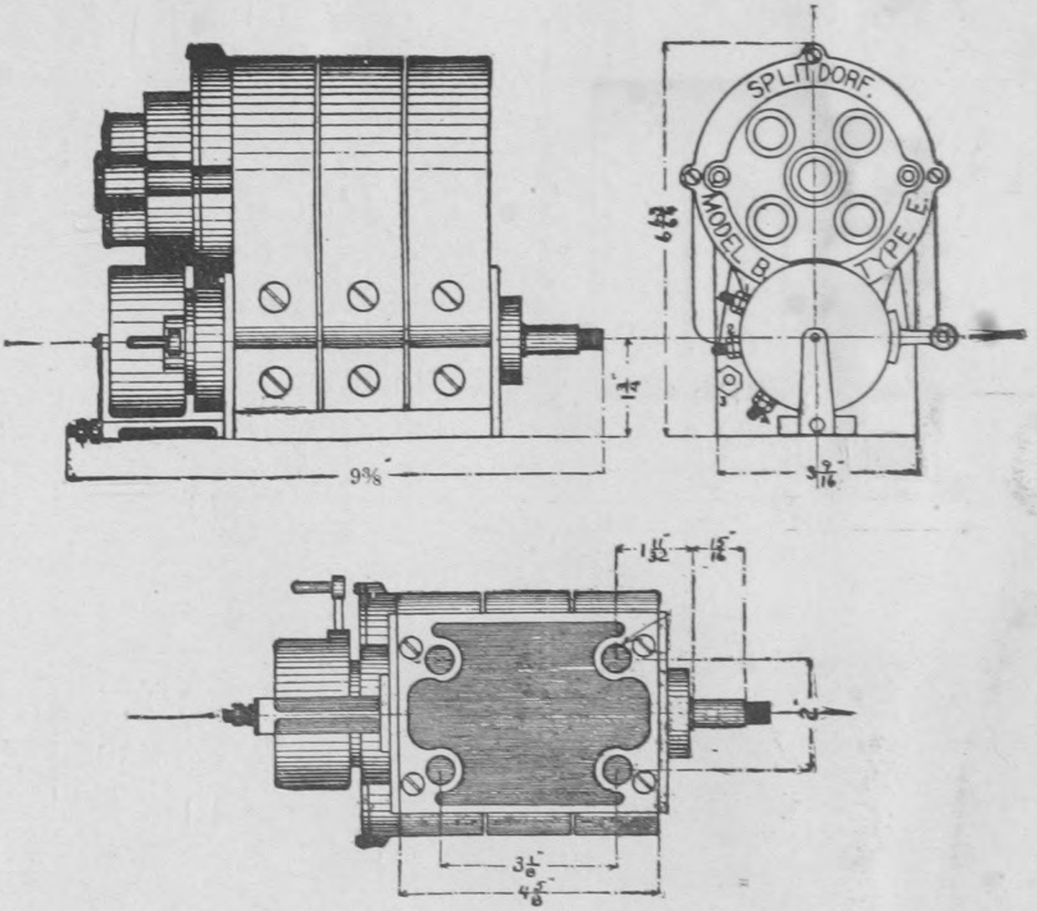
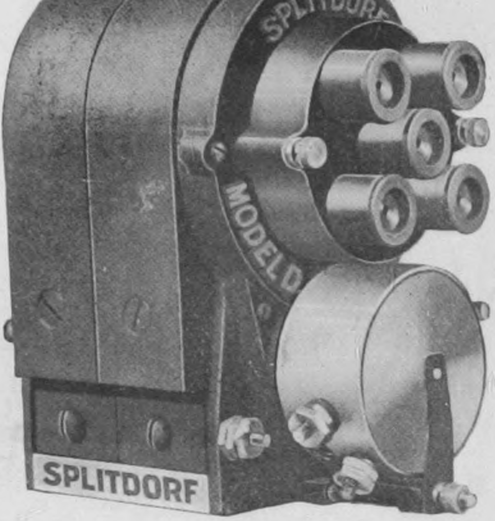

SPLITDORF
MODEL B
TYPE E
6¾
1¼"
9⅜"
3 9/16"
1 15/32"
15/16"
2"
3⅛"
4⅝"

Fig. 11.

Model B $150 Complete


SPLITDORF
MODEL D
SPLITDORF

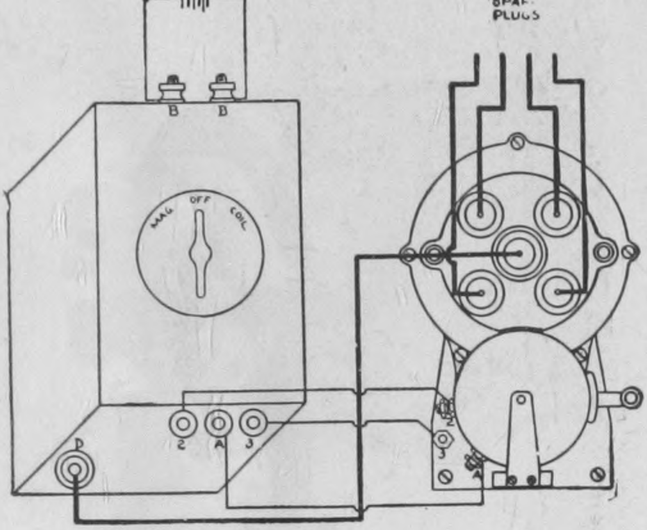
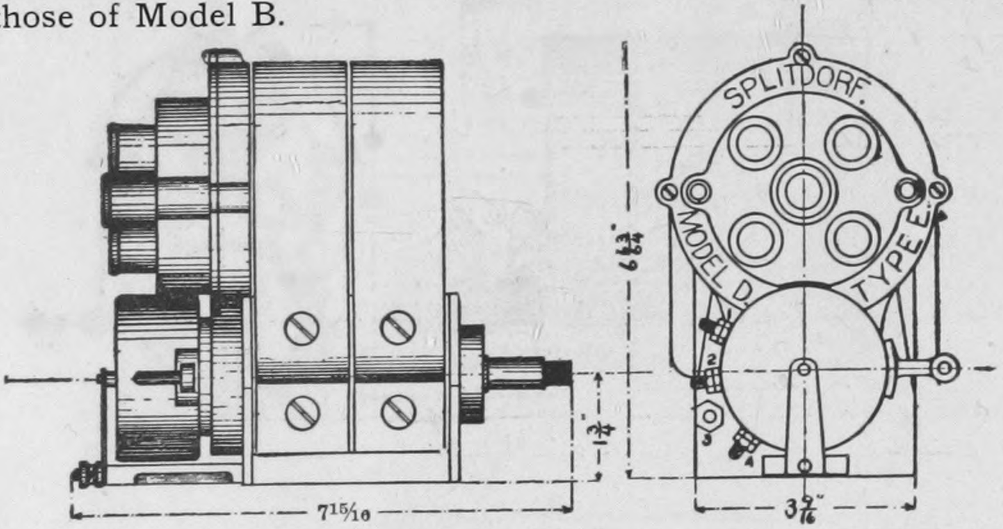

SPARK PLUGS
B
B
MAG
OFF
COIL
2
A
3
D
2
3
A

Fig. 12. Model D, $125 Complete. *Fig. 13.* Wiring Diagram—Model D Magneto.

This model has been developed for use on four cylinder cars having small motors, especially where room is limited. It has four magnets in two pairs and is essentially similar to our Model B in most of its parts. The non-vibrating type of transformer, only, in either the dash or tube form, is used with this model.

The instructions for setting and operating are precisely the same as those of Model B.


SPLITDORF.
MODEL D
TYPE E.
6 43/64"
1 3/4"
7 15/16
3 9/16"
2
3
A

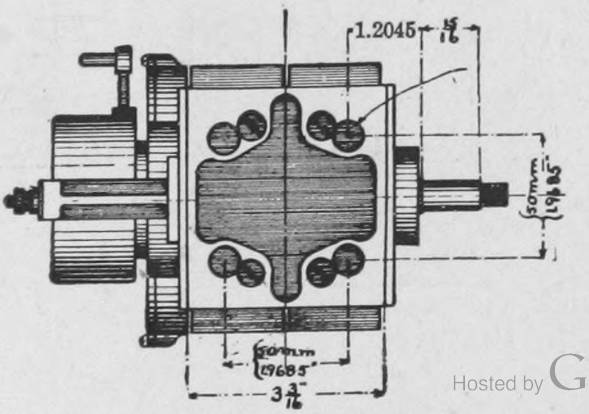

1.2045
5/16
50mm
1.9685
50mm
1.9685
3 3/16

Fig. 14.

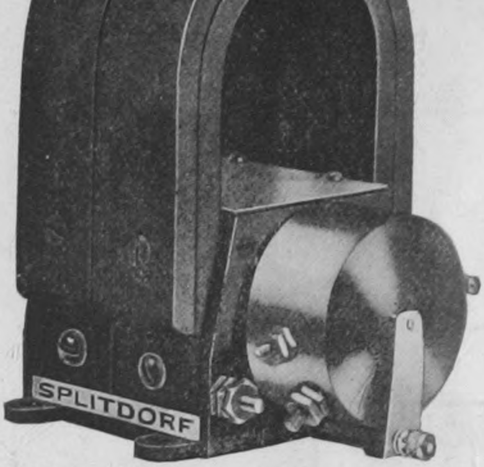


Fig. 15. Model G, $100 Complete.

This Model is suitable for all motors having two cylinders firing at 18 degrees apart. (All double oppose horizontal motors and all vertical motors having cranks set together ar fired in this manner. Vertical motor whose cranks are set opposite fire a 90 degrees and a Model D is necessary as it has a distributor of which two o the points can be grounded).

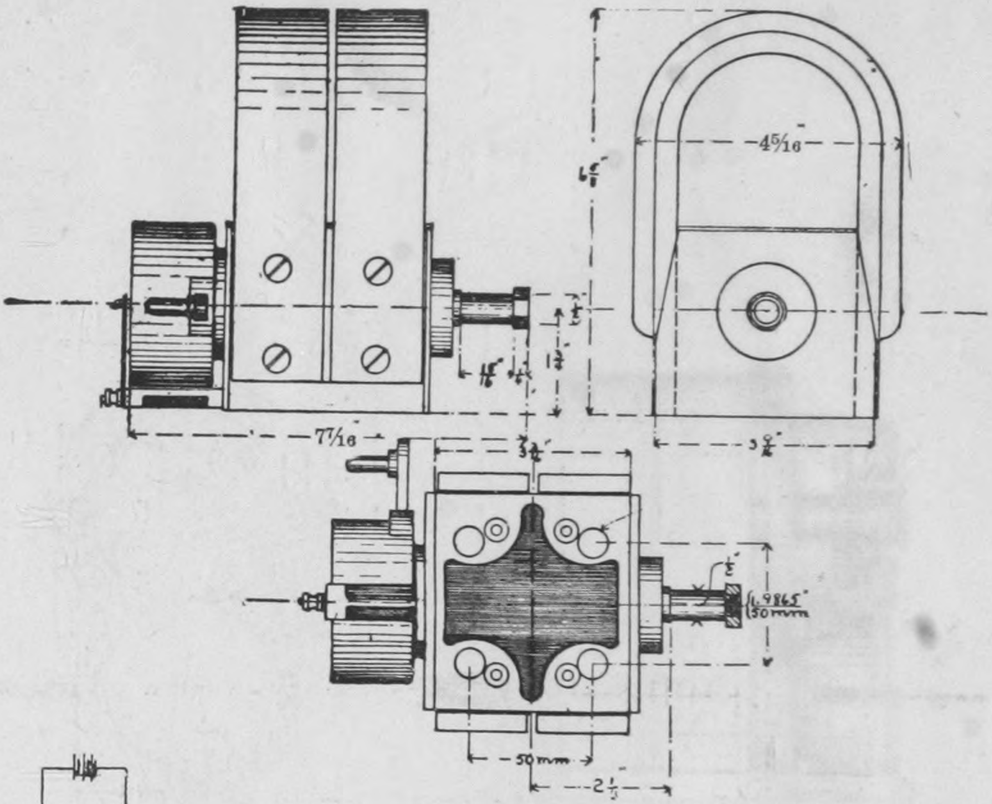
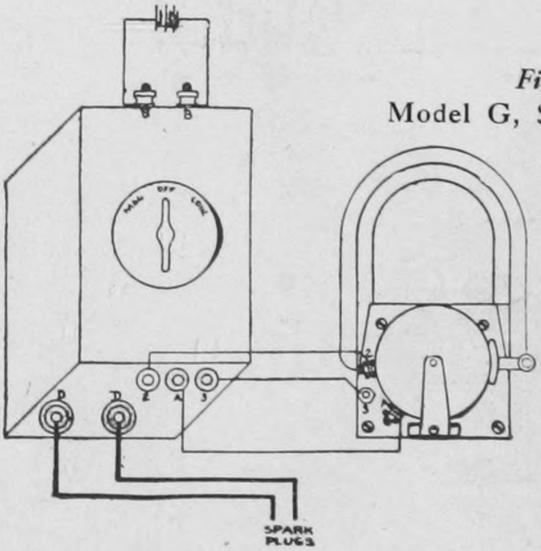

4 5/16"
7 7/16"
50 mm
1.9865"
50 mm

Fig. 16.
Model G, $100 Complete.


B
B
MAG
OFF
COIL
E
A
3
D
D
SPARK PLUGS

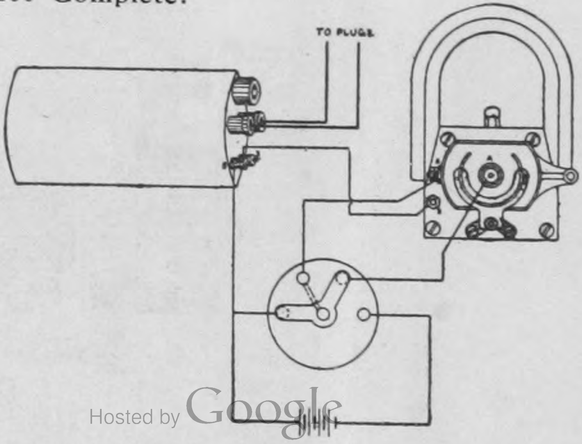


Fig. 17. Wiring Diagram Model G with

Fig. 18. Wi

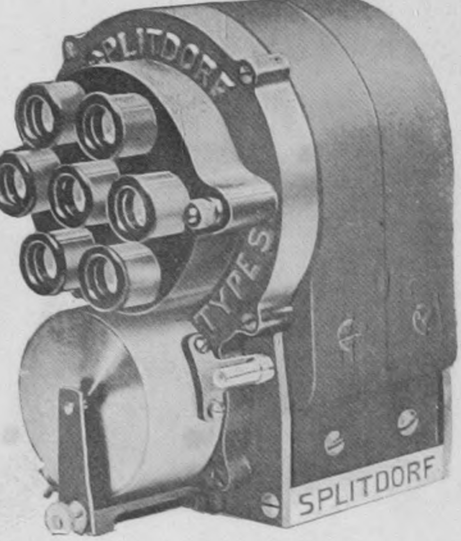

SPLITDORF
TYPE S
SPLITDORF

Fig. 19. Model S, $150 Complete.

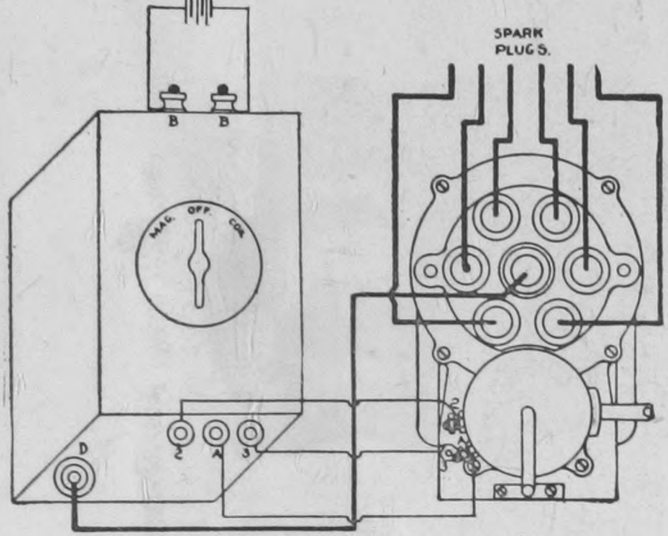

SPARK PLUGS.
B
B
MAG.
OFF.
COIL
D
2
A
3
2

Fig. 20. Wiring Diagram Model S or SS.

This Model is suitable for light four cycle motors having six cylinders. It has four magnets in two pairs.

The instructions for installing and operating are similar to Model B, except that it must be driven one and one half times the speed of the crankshaft.

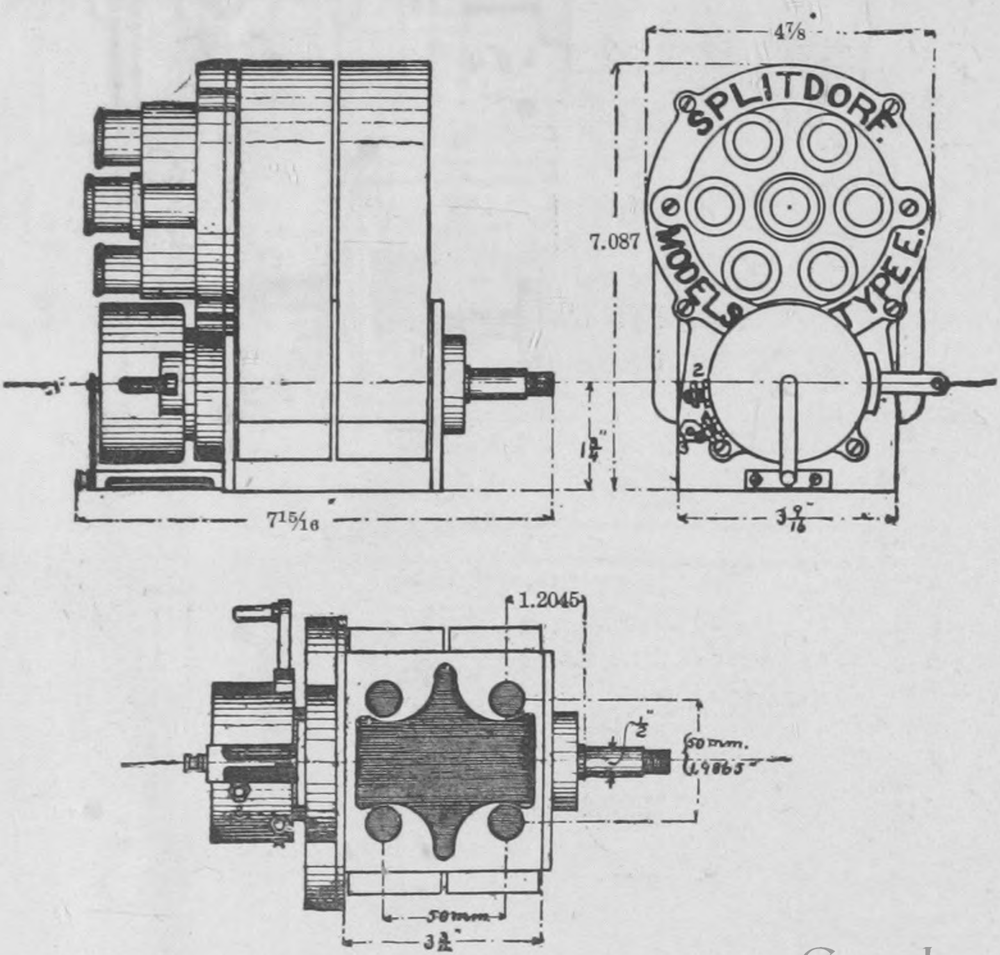

4⅞
SPLITDORF.
MODEL S
TYPE E.
7.087
2
1¾"
7 15/16
3 9/16"
1.2045
½"
50 mm.
1.9685"
50mm
3 3/32"

Fig. 21.

Model S, $150 Complete.

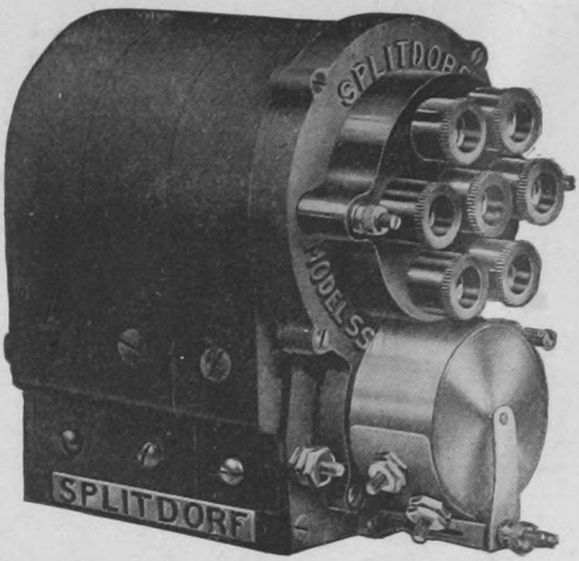

SPLITDORF
MODEL SS
SPLITDORF

Fig. 22. Model SS, $160 Complete.

This Model is precisely the same as Model S, except that it has six magnets in three pairs and a longer armature and pole pieces, and is especially adapted for heavy, slow-moving motors.

The instructions for installing are exactly the same as for Model S, this machine simply being larger and more suitable for large, heavy cars having slow-moving motors.

The Tube Transformer (Figure 29) is furnished with this Model as an option instead of dash Transformer.

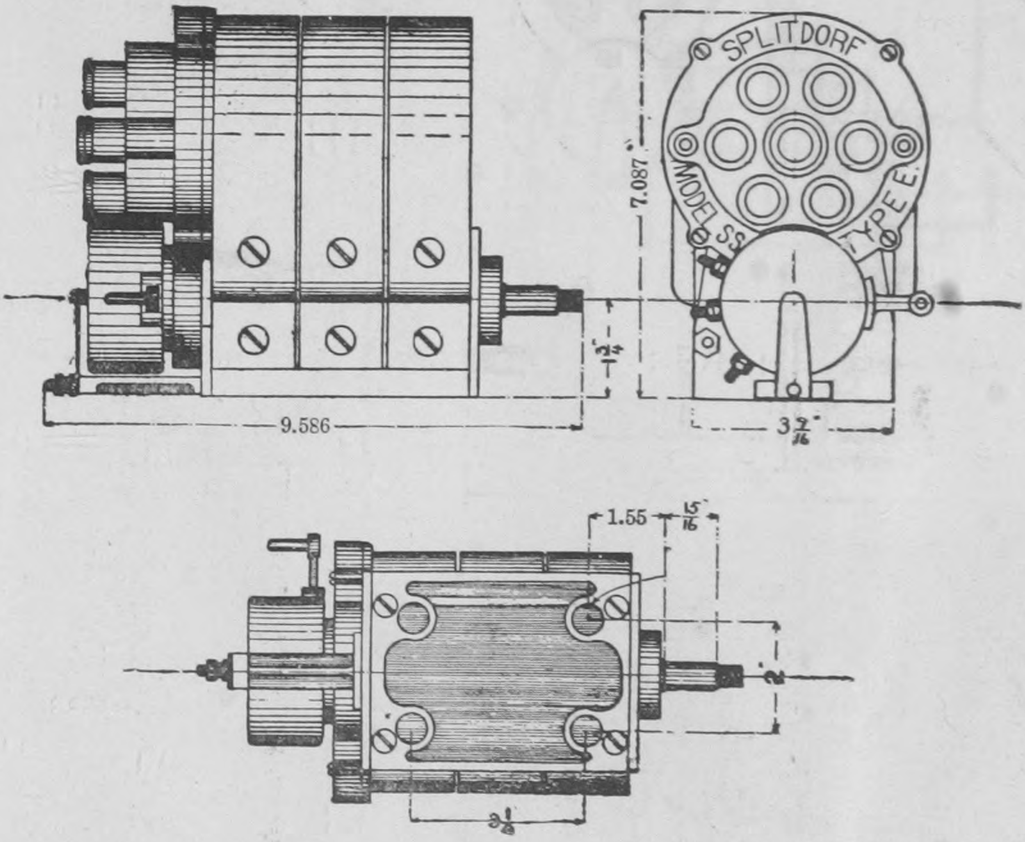

9.586
1¼"
7.087"
SPLITDORF
MODEL SS
TYPE E.
3 7/16"
1.55
15/16"
2
3 1/8

Fig. 23.
Model SS, $160 Complete.

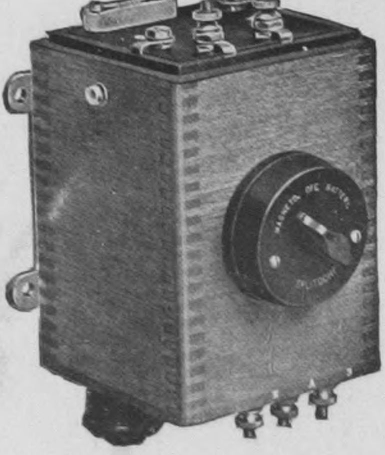

MAGNETO OFF BATTERY
SPLITDORF

Fig 24. Non-Vibrating Transformer.

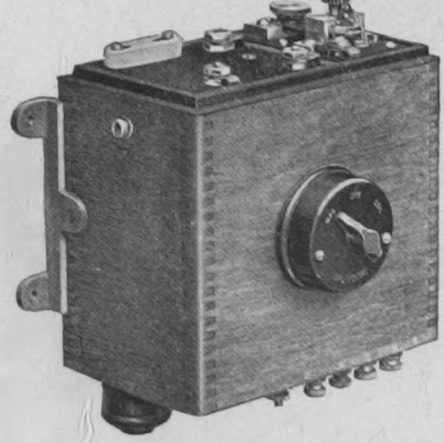


Fig. 25. Vibrating Transformer.

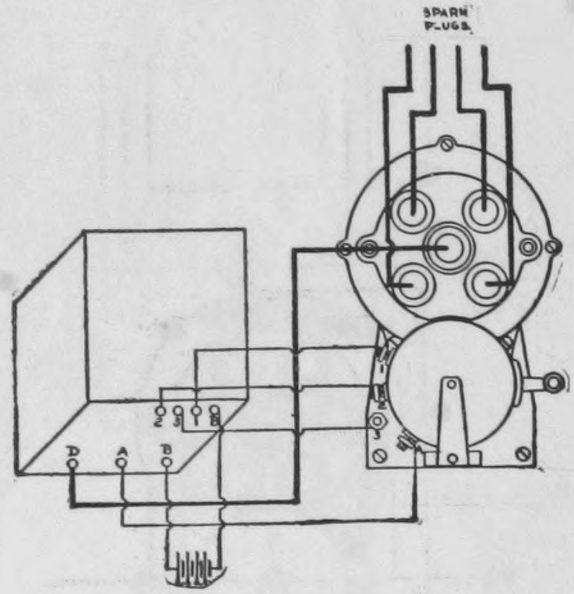

SPARK PLUGS
2
3
1
B
D
A
B

Fig. 26. Wiring Diagram Model B Magneto with Vibrating Transformer.

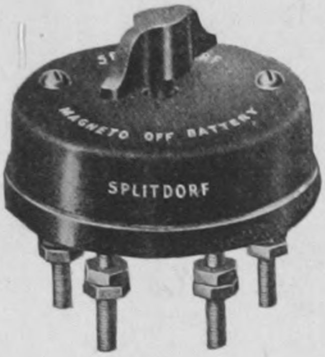
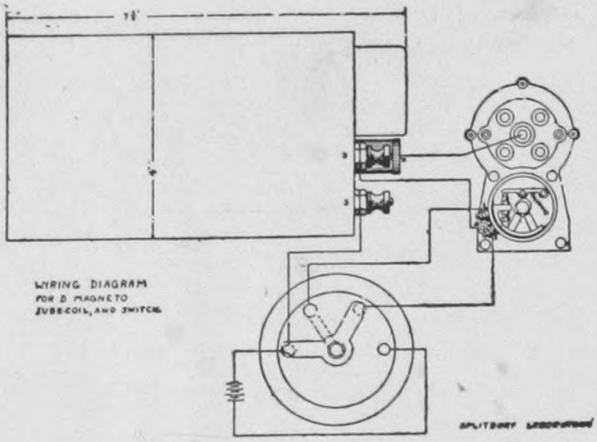

MAGNETO OFF BATTERY
SPLITDORF

Fig. 27. Switch.


WIRING DIAGRAM
FOR D MAGNETO
TUBE-COIL, AND SWITCH
SPLITDORF LABORATORY

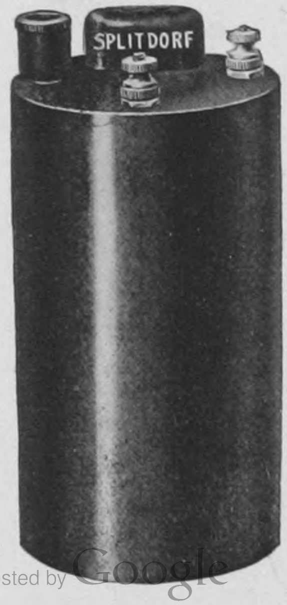
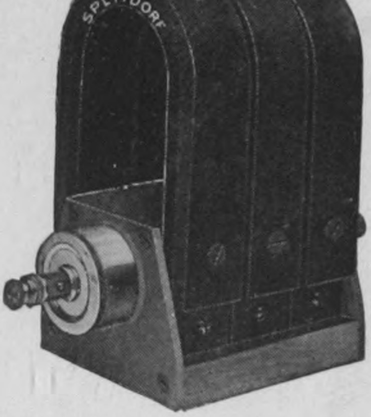


Fig. 28. Wiring Diagram for Tube Trans-



This Magneto is exactly of the same material and workmanship as the foregoing Models. It has annular ball bearings and can be used for all low tension work. It will operate any number of cylinders, and can be driven either right hand or counter. It is driven at crankshaft speed for four cylinder four cycle motors.

Fig. 30. Model L, $50 Complete.

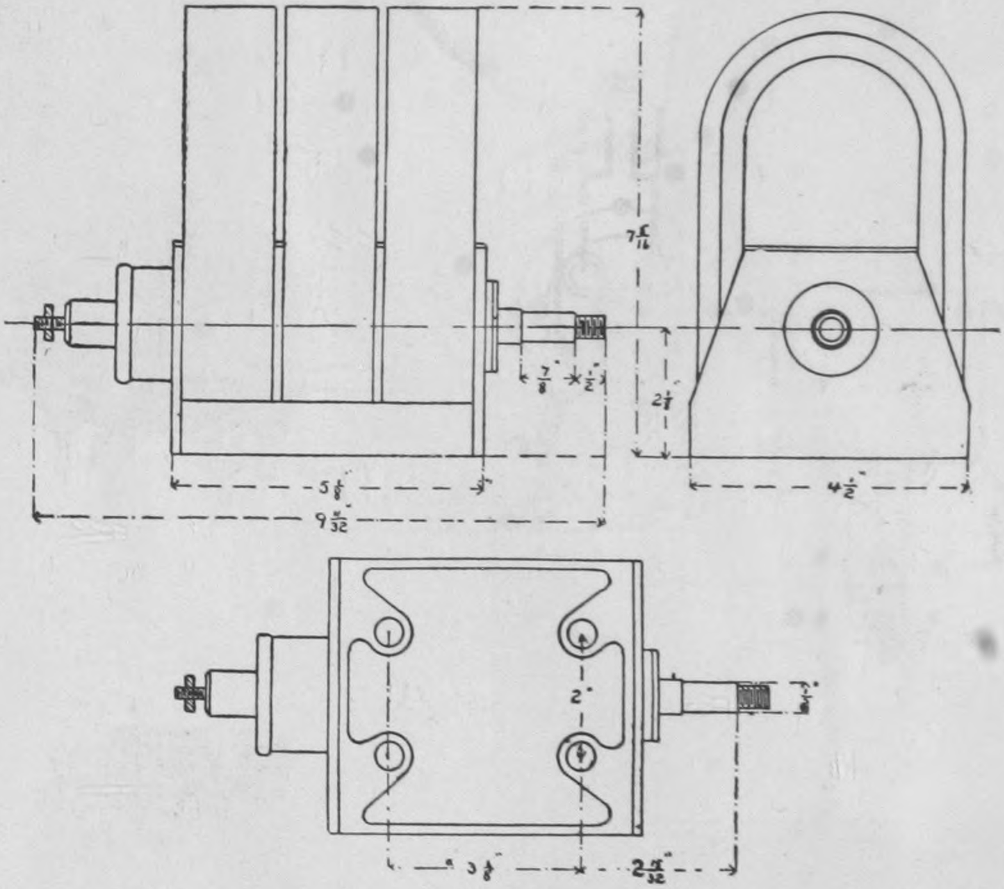


Fig. 31.
Model L, $50 Complete.

GUARANTEE.

We guarantee our product to be free of all defects in material and workmanship for one year from date of purchase, but we do not guarantee against misuse, wilful neglect or bad installation.

We will replace any defective parts when presented at our factory, transportation charges prepaid, 261, 263, 265 Walton Avenue, New York, or at any of our regular branches.

Don't test your Magneto unless you have it completely assembled, i. e., breaker box in place and distributor cover with wires attached.

Don't think it necessary when washing the car to flood the Magneto with water. All high tension instruments work better when not flooded with water. This will be thoroughly appreciated by those who have driven with the old type coil ignition.

Don't open up the spark plug gaps nor permit them to burn themselves open more than 1/32 of an inch.

Don't flood the breaker box when oiling the little roller on the breaker bar. The oil should be applied with a toothpick about once a month.

Don't expect your Magneto to operate if you permit the frayed ends of your wires to come in contact with each other or the metal parts of the instrument.

Don't dissect the instrument to see what makes the wheels go around, unless you are an expert. We put the right number of wheels inside when we make it.

Don't drive the motor with the spark retarded, but as far advanced as the motor will permit.

Don't leave your switch turned to battery over night. Be sure it is in the "off" position.

Don't try to improve the adjustment of the platinum points in the breaker box. This means a cool motor unless they are less than 1/32 of an inch.

Don't disconnect the wires leading from the Magneto to the coil, unless you are careful to get them back according to their respective letters. Crossed wires mean burned out connections.

Don't pull out the carbon brushes in the distributor because you think there is not enough tension on the springs.

Don't fail to put back your wire gauze brushes in the breaker box when putting the breaker box back on the magneto. Do not smash them over.

Don't pull out your switch plug until after you have placed your switch on the off point.

IMPORTANT!

All moving parts of our Magnetos are equipped with the finest type of annular ball bearings which we pack in grease while assembling. Nevertheless we have placed an oiler at each end of the armature shaft, and it will do no harm to put a drop of oil in the oiler, say once a month. Some of our Models do not have these oilers, in which case it will not be necessary to apply any oil.

Thousands of Satisfied Users Can Testify to the High Quality of the

COMMON SENSE PLUG

This Plug, which is really a Mica Plug and whose construction is clearly shown on this page, has jumped into popularity with the users of gasoline motors in a manner which leaves no possible doubt that the Plug is made on the right lines. Those motors which are equipped with Magnetos have found it especially valuable, as it seems to be the only Plug on the market today that will withstand the combined ravages of the intense heat of the Magneto spark and the natural heat in the cylinder of a gasoline motor. It is a common occurrence for sets of these Plugs to remain unchanged in the cylinders over a year.

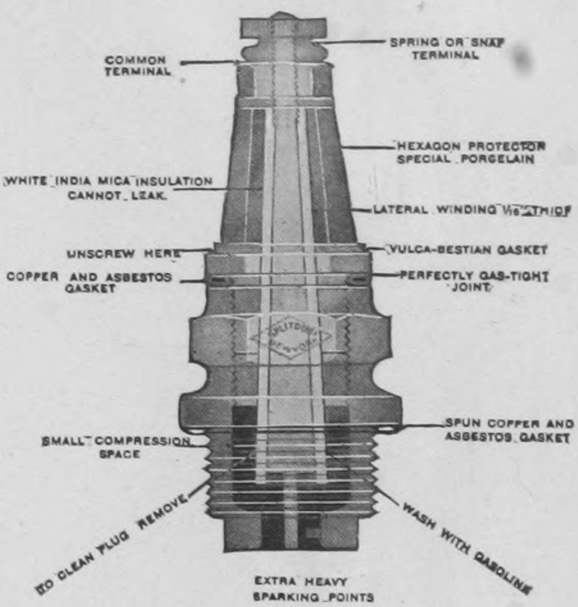
Made in all sizes and threads.

DON'T BE CAUGHT EMPTY-HANDED, MR. DEALER!

You can sell your customers Common Sense Plugs with the assurance that the SPLITDORF guarantee of Absolute Satisfaction is behind them.

Order a sample dozen today.

WILL OUTLAST YOUR MOTOR


COMMON TERMINAL
SPRING OR SNAP TERMINAL
HEXAGON PROTECTOR SPECIAL PORCELAIN
WHITE INDIA MICA INSULATION CANNOT LEAK
LATERAL WINDING 1/16" THICK
UNSCREW HERE
VULCA-BESTIAN GASKET
COPPER AND ASBESTOS GASKET
PERFECTLY GAS-TIGHT JOINT
SPLITDORF NEW YORK
SPUN COPPER AND ASBESTOS GASKET
SMALL COMPRESSION SPACE
TO CLEAN PLUG REMOVE
WASH WITH GASOLINE
EXTRA HEAVY SPARKING POINTS

C. F. SPLITDORF

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SPLITDORF
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Main Office and Factory

261-3-5 Walton Avenue
Corner 138th Street

New York

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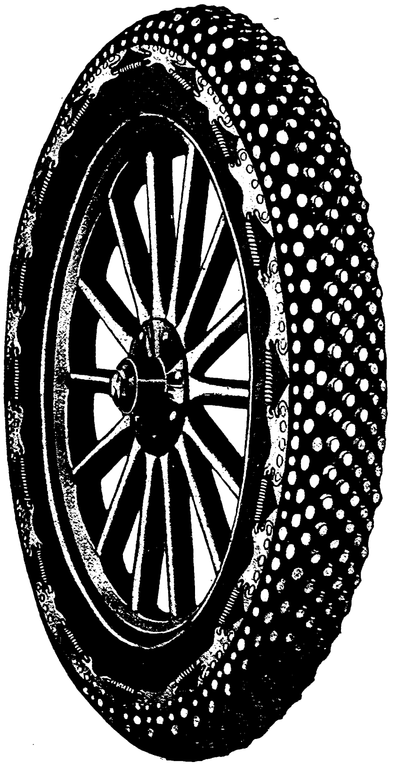
CHICAGO: 319 Michigan Ave.
DETROIT: 868 Woodward Ave.
BOSTON: Motor Mart
SAN FRANCISCO: 520 Van Ness Ave.

LONDON: 139 Long Acre
PARIS: 88 Avenue des Ternes
BRUSSELS: 33 Square Guttenberg
BARCELONA: 433 Consejo de Ciente
TURIN: 64 Via Santa Clara
JOHANNESBURG: 7 Simmonds St.

Reduction in Tire Expense



In spite of the fact that tires have gone up in price and are going still higher you can reduce your tire bills to about one-half of what they have been and do away with tire trouble—punctures, skidding, etc.,—by using WOODWORTH TREADS.

The 1910 Woodworth Improved Self-Adjusting Tread

is more durable, neater in appearance and easier to apply than the older styles.

The new coil spring adjustment allows the cover to stretch enough for any make of tire and automatically holds the TREADS at just the right tension.

Anyone can quickly and easily fit them to any make of tire.

They cannot be put on wrong.

The springs always hold them snug and smooth so they cannot injure the tire.

The leather of the new Tread is treated by a new process which keeps it soft and pliable so that it never cracks or breaks up between the rivets. This with an improved rivet makes them give about double the mileage of the older styles.

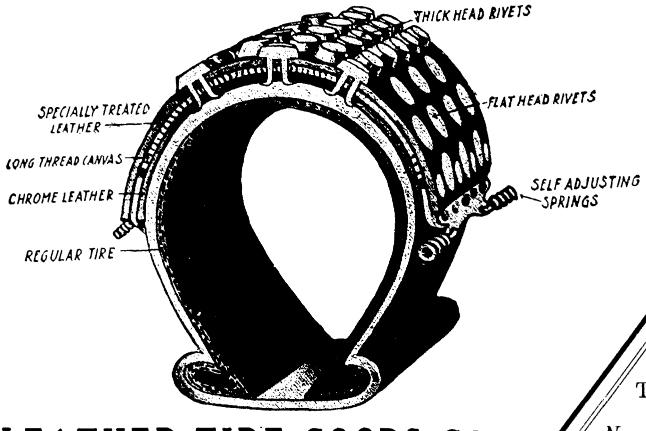
PRICES:

28x3	$10.75	32x4	$18.50
30x3	11.75	33x4	19.25
30x3½	14.50	34x4	20.00
32x3½	15.75	36x4½	24.50

Other sizes in proportion.

We deliver them express prepaid where we have no agents.

Send coupon for circular and get posted on how to save money and feel safe from tire troubles.



LEATHER TIRE GOODS CO.
NIAGARA FALLS, N. Y.
Canadian Factory at Niagara Falls, Ont.

Leather Tire Goods Company, Niagara Falls, N. Y.

Send me circular giving description and prices of the Improved Self-Adjusting Tread.

Name ____________________

Address ____________________

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91

The Star

THE wise automobilist is always guided by the Star trademark on a wrench package, for he knows it stands for wrench perfection, consequently freedom from the troubles which are sure to beset those who depend on inferior makes. Every **Genuine Coes Wrench** package and wrench is so marked. Be sure to look for the Star. None genuine without it.

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Wise Men

Coes Wrenches are the strongest and most durable made. It is for this reason that they outsell all other makes. For seventy years we have been engaged in their manufacture. In that time we have learned a good deal about wrenches, as you can imagine. You get the benefit—when you buy the **COES.**

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"Safety Requires, Above All, an Unbreakable Frame"

COLONEL SPRAGUE'S NEW AIR CUSHIONED "LEADER" WIND SHIELD

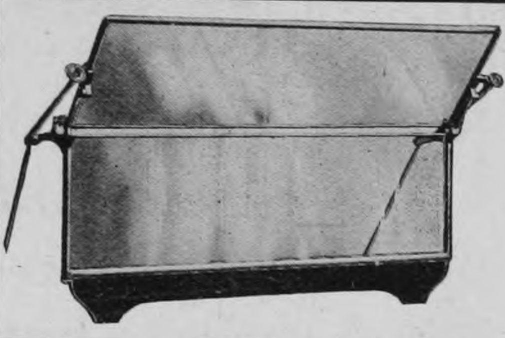
has an unbreakable frame, and is as automatic as good mechanical sense and safety will allow.

The New "Leader" is the result of nine years' consistent progress in making wind shields of the highest class.

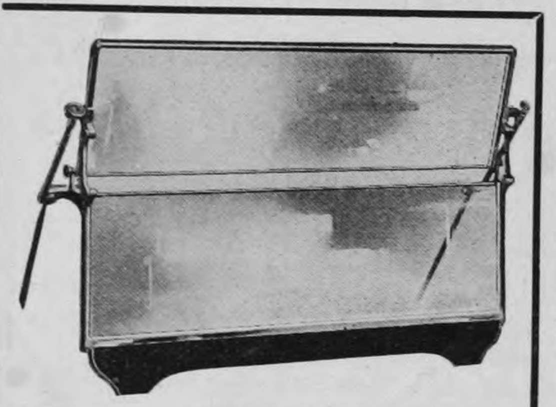
WHY BUY?

Because It Has Many Exclusive Features

No other shield can be rigidly held in four positions: upright or closed; down or folded; tilted back to give air to the back seat; carried forward so as to make a clear space between the upper and lower sash, so you can see your way in foggy weather.

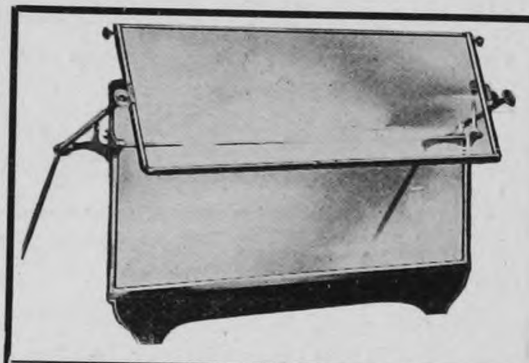


TILTED BACK—AIR TO BACK SEAT



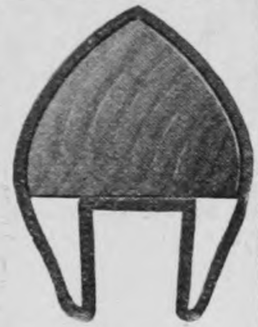
TILTED FORWARD—CLEAR VISION

No other shield has an Air Cushioned Locking Device. Ours works easily and positively, and holds the shield rigid in each of the above positions. It cannot get out of order.



DOUBLE HINGE—FOLDING

No other shield is made with lower sash moulding striding the filler board, that is attached to the dash, thus preventing its warping.



No other shield has a combined double and single hinge which may be used together or independently, so as to miss any steering wheel.

No other shield has a wood filled tubing to which curtain buttons may be attached.

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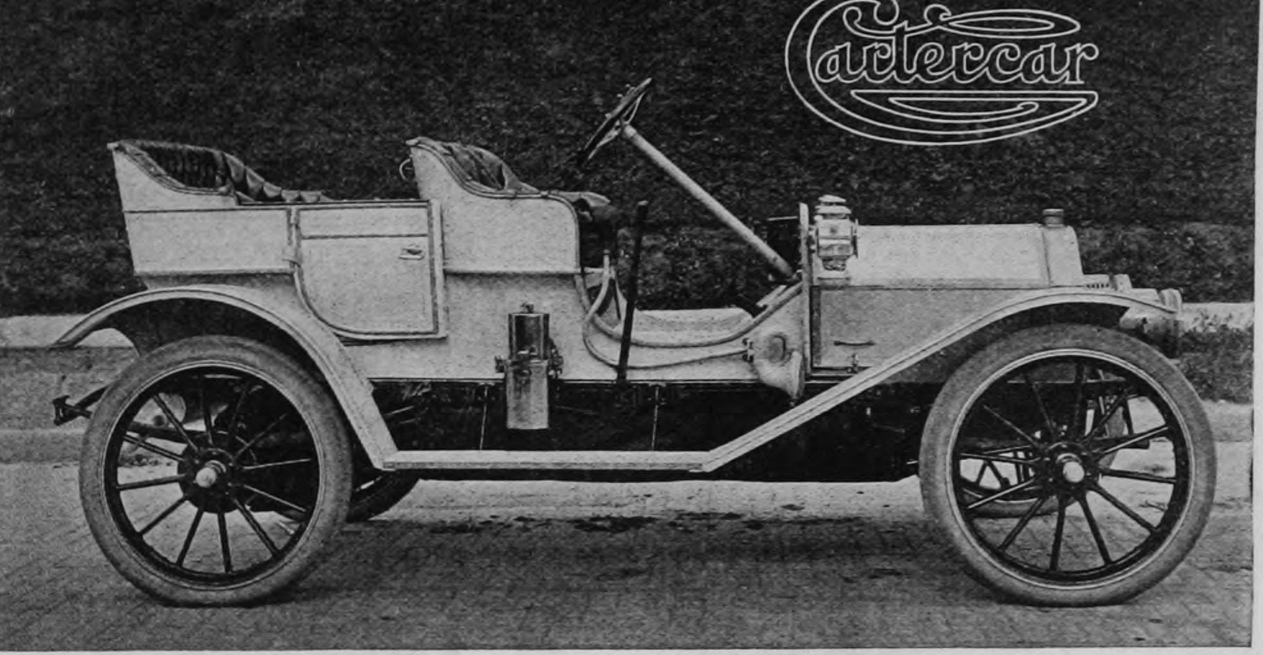
The Sprague Umbrella Co.



NO clutch to slip--NO gears to strip--NO grease packing to renew--NO shafts to twist--NO universal joints to wear--NO bevel gears to howl--NO noise--A thousand speeds--And only one control lever, that's a Cartercar.

The Cartercar will climb a 50% grade with a full load, and do it easily.

The Cartercar will move behind a loaded truck on a city street, or travel as fast as you wish on a country road on high gear.

All of these things are possible in the Cartercar because of its friction transmission and chain-in-oil-drive.

The Friction transmission will stand a large amount of careless handling by the inexperienced without injury.

The fibre facing on the friction wheel will wear for upwards of 4,000 miles, and a new one lists at $3.00.

A case protects the chain from dust and grit and permits it to run in an oil bath.

This makes the chain wear for years.

Nearly all of the power of the Cartercar is delivered to the rear wheels, enabling it to do what other cars cannot.

They are simple to learn to operate, easy to care for, and economically maintained.

All models come equipped with magneto, gas lamps, generator, oil lamps, horns, mats, tools, jacks, and tire kit.

Model "H," with single rumble seat, $1,100. With double rumble seat, $1,125. With double divided rear seat, $1,150. With miniature tonneau, $1,150.

Model "L" touring car, $1,600.

C. A.
T. J.

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Pontiac, Mich.

Gentlemen:

Please mail me your new 1910 Catalog describing and illustrating your complete line.

Name ....

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To make Rushmore Lamps the best light-givers—

To make them the most durable—

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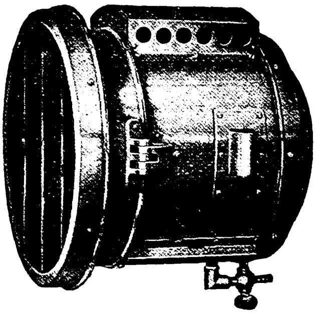
The cheapest to maintain—

The best insurance for night motoring—

To sell them at a fair price—



To make the owner of Rushmores want them on his next car—

To make our profit in factory economies, not in quality cutting –

To better our product whenever we saw a chance to do so—

To see how much we could save our customers—not how much we could make them spend—

To make the best generator in the world, and one of which we could afford to be proud—

To give a square deal and demand one—

Such has been our policy and our ambition since the first Rushmore Navy Standard Automobile Searchlight was made in 1900. It is our policy and our ambition still.

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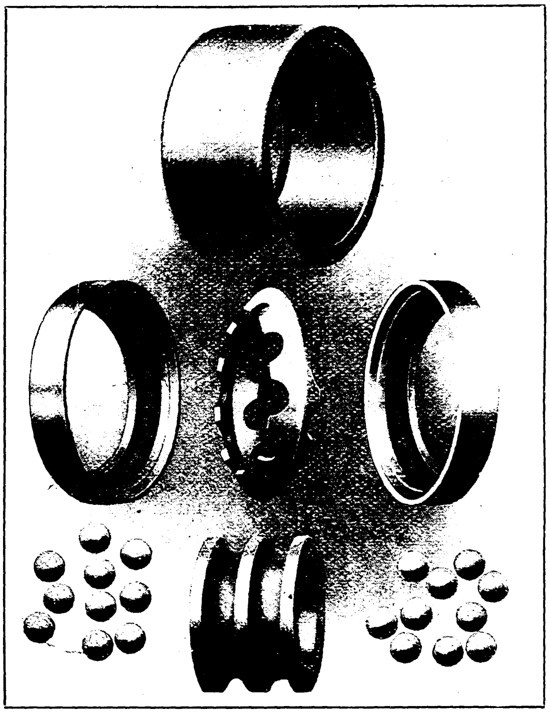
THAT IS IN DEMAND



THE NEW DEPARTURE BALL BEARING

meets the requirements of automobile manufacturers so successfully that it has been adopted for fully fifty models of 1910 cars.

¶ Without departing from the simplicity which characterizes the single row type, this bearing offers valuable advantages. It carries radial and thrust load with equal efficiency. Its two rows of balls greatly increase its capacity and durability. It economizes space, weight and labor.

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THE NEW DEPARTURE MFG. CO., BRISTOL, CONN.

Guaranteed for 5000 Miles

Still Another Astounding Performance of

AJAX TIRES

Five Cars in the New York to Atlanta Endurance Run, Covering 1,000 Miles, Using only 20 AJAX TIRES from Start to Finish, End the Run at Atlanta with a Total of

3 PUNCTURES!

It is difficult to become enthusiastic over the performance of AJAX TIRES for the reason that they make such wonderful records one after the other that they are positively bewildering in their magnitude. Take this latest achievement, which is characteristic of their recent performances. Not a change of tire on 5 cars over 1,000 miles of all kinds of roads—and only three punctures. Is there any other automobile tire in the world that can show such a record?

This achievement is all the more astonishing when we tell you that one of the cars in this run started out with four tires of another make and, finding them unsatisfactory, changed to AJAX TIRES and finished at Atlanta on the latter—without a mishap.

OUR NEW ATLANTA BRANCH

was opened on November 1st at 38 Auburn Ave. This is the first branch store we have opened in the South, and it will have every facility for taking care of all AJAX TIRE business in that section.

THE AJAX EXHIBITS AT THE NEW YORK SHOWS

will be among the most attractive and interesting to be seen there. All visitors to these Shows are cordially invited to make the AJAX booths their headquarters.

A NOTE TO THE TRADE AND THE PUBLIC

Notwithstanding knocking and lying reports to the contrary, the AJAX factories at Trenton are working night and day in an effort to keep pace with orders. The recent increase of capital stock to $1,000,000 and the constant development of our manufacturing and distributing facilities will enable us to handle all present and future business with complete satisfaction to all concerned.

And Remember—AJAX TIRES are Guaranteed for 5,000 Miles or 200 Days' Service. Write for a copy of our Guarantee.

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General Offices: 1777 Broadway, NEW YORK

FACTORIES: Trenton, N. J.

Philadelphia, 316 N. Broad St.; Boston, 15 Park Square; Atlanta, 38 Auburn Ave.; Detroit, 743 Woodward Ave.; Denver, 1529 Cleveland Place; Seattle, 917 East Pike St.; San Francisco, Golden Gate & Van Ness Aves; Los Angeles, 1038 S. Main St.; Chicago, 1425 Michigan Ave.; Minneapolis, 905 First Ave., South; Kansas City, 1422 Grand Ave.; Portland, Ore., 142 Nineteenth St.; NEW YORK, 57th STREET and BROADWAY; Milwaukee Agents, Goodyear Rubber Company; St. Louis Agents, Goodyear Rubber Company.

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The Master Magneto!

U & H MAGNETOS

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J. S. BRETZ COMPANY

**F. & S. ANNULAR BALL BEARINGS
HARTFORD UNIVERSAL JOINTS
GERMAN STEEL BALLS
U.&H. MASTER MAGNETOS**

TIMES BUILDING

NEW YORK, November 1st, 1909.

TO THE READERS OF THE CYCLE AND AUTOMOBILE TRADE JOURNAL:—

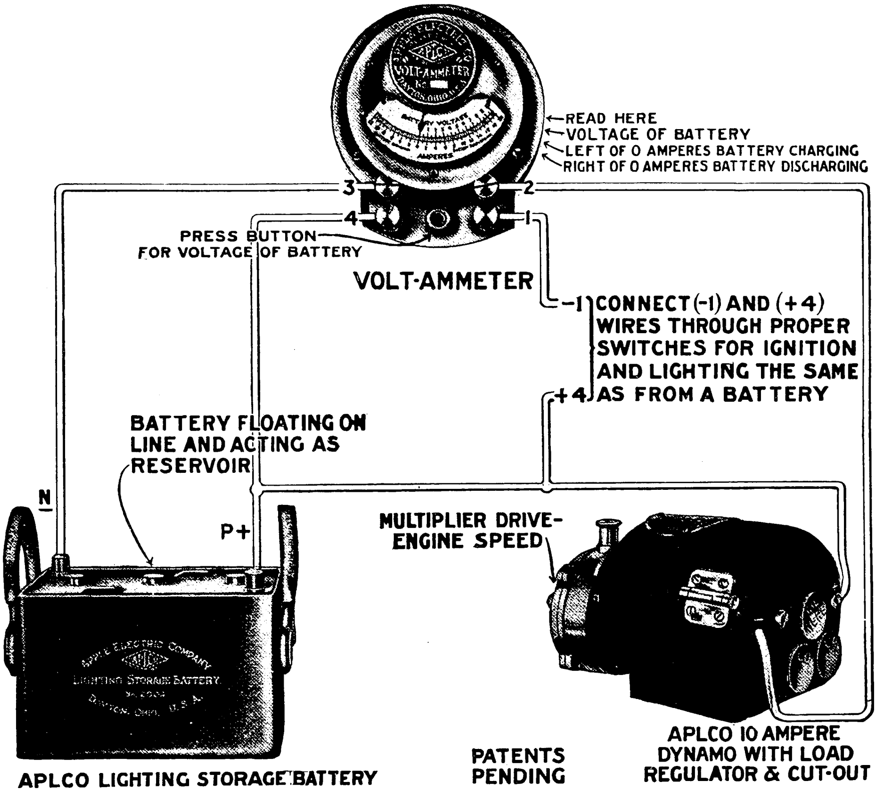
Permit us to call your attention to the U. & H. MASTER MAGNETOS. Herr Unterberg, who for years designed and constructed the best known magnetos of the day, but sold under other names, is the head of the German firm of Unterberg & Helmle, makers of the famous U. & H. MASTER MAGNETOS. He is Europe's greatest ignition expert, and now, after being a Pioneer in electrical effort a score of years ago, he has become a Veteran.

With the confidence born of such long and varied experience we take the liberty of calling to your attention the feature of one type of the U. & H. MASTER MAGNETO, which we think is essentially adapted to commercial vehicle use. We refer to the Fixed Method of Ignition, which does away with all spark advancing and retarding mechanism, making it peculiarly adapted for motor wagon, taxicab and similar service. The Fixed Method of Ignition being entirely suitable, and for commercial applications much preferable to the variable spark, owing to the inability of the operator to damage the motor and other mechanism by advancing the spark too far, and thus subjecting the motor and other parts of the moving mechanism of the chassis to severe strains. Our new catalog tells the story.

Yours, &c.,

J. S. BRETZ COMPANY.

An Automobile Improvement Which Makes It Safer, Simpler and More Economical


READ HERE
VOLTAGE OF BATTERY
LEFT OF 0 AMPERES BATTERY CHARGING
RIGHT OF 0 AMPERES BATTERY DISCHARGING
3
2
4
1
PRESS BUTTON FOR VOLTAGE OF BATTERY
VOLT-AMMETER
-1
+4
CONNECT (-1) AND (+4) WIRES THROUGH PROPER SWITCHES FOR IGNITION AND LIGHTING THE SAME AS FROM A BATTERY
BATTERY FLOATING ON LINE AND ACTING AS RESERVOIR
N
-
P+
MULTIPLIER DRIVE-ENGINE SPEED
APLCO 10 AMPERE DYNAMO WITH LOAD REGULATOR & CUT-OUT
PATENTS PENDING
APLCO LIGHTING STORAGE BATTERY

The latest and most novel use to which electricity has been put in the last year or two is for electric lighting, in addition to igniting gasoline automobiles, as is now accomplished by the "Aplco" Electric Lighting System for automobiles as has recently been perfected by V. G. Apple and his corps of engineers and mechanics.

The "Aplco" System eliminates flame with its fuel of coal oil and acetylene entirely from the car.

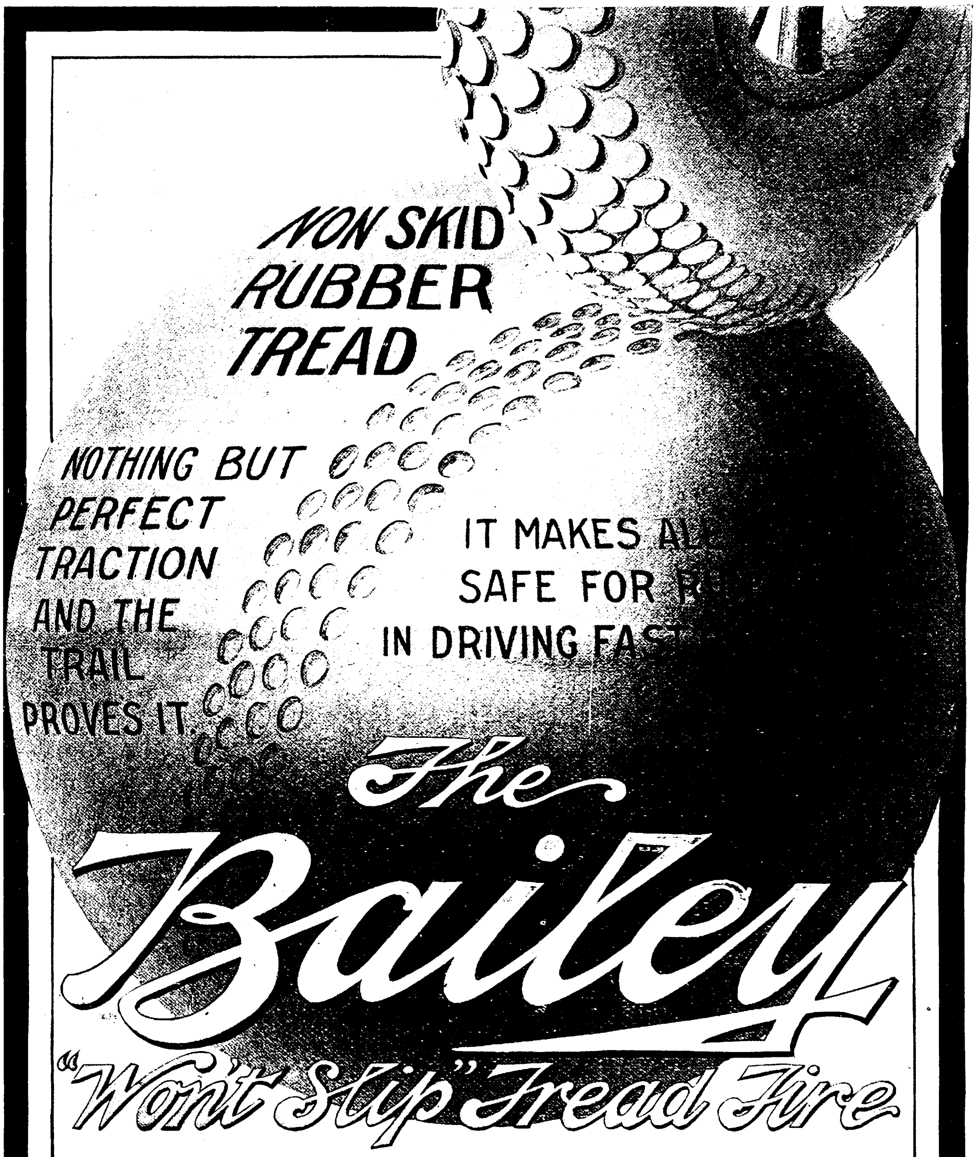
The "Aplco" System saves the cost of coal oil, carbide and having batteries and gas tanks continually recharged in addition to the time saved.

The "Aplco" System replaces dry batteries, vibrator coils, troublesome timers, magneto, gas tank or acetylene generator, coal oil, acetylene gas, carbide, oil lamp fixtures, gas lamp fixtures, matches, loss of time stopping car to light and regulate acetylene gas, as with the electric system it is all done by switches from the seat at will.

Besides the greater convenience of an electric lighted auto, the light, which is whiter and stronger, will be projected farther than is now possible with the acetylene headlights now commonly in use. The electric lighting of automobiles, in addition to being more convenient, is much more economical, as it saves the total cost of oil, carbide or acetylene and the expense, trouble and annoyance of having batteries and gas tanks continually recharged.

Can be installed on any machine. Send for descriptive booklet. Agents wanted in unoccupied territory.

APPLE ELECTRIC COMPANY, 20 N. CANAL STREET
DAYTON, OHIO, U. S. A.


NON SKID
RUBBER
TREAD
NOTHING BUT
PERFECT
TRACTION
AND THE
TRAIL
PROVES IT.
IT MAKES A
SAFE FOR
IN DRIVING FA
The
Bailey
"Wont Slip" Tread Tire

Why take the risk? **Accidents** from skidding are more **numerous** and **fatal** than from any other cause. The time to **use Bailey "Wont Slip" Tread Tires** is **all** the time on **all** wheels of **Motor-Cars** and **Motor-Bicycles. Do-it-now.** They are as **essential** as a **Rudder** is to a **Ship.**

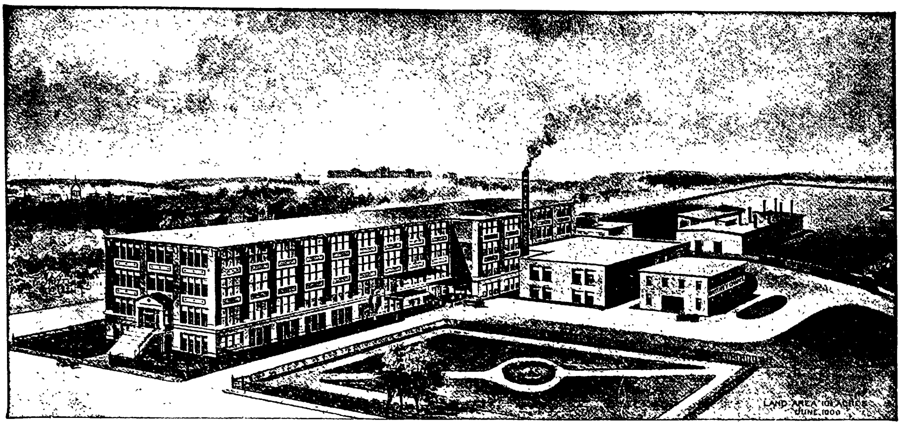
For sale by all dealers throughout the world. Write us for descriptive booklet.

C. J. BAILEY & CO., Patentees, 22 Boylston Street, Boston, Mass.

LICENSED MANUFACTURERS—in the United States

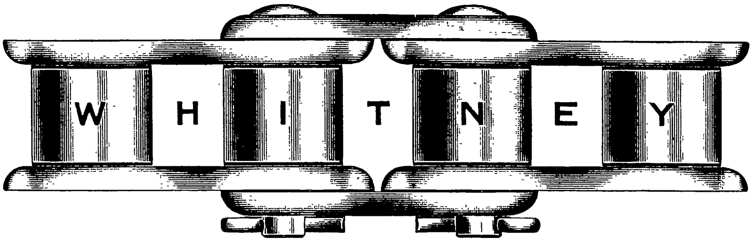
THE B. F. GOODRICH CO., Akron, Ohio
THE DIAMOND RUBBER CO., Akron, Ohio
THE FISK RUBBER CO., Chicopee Falls, Mass.
HARTFORD RUBBER WORKS CO., Hartford, Conn.
G. & J. TIRE CO., Indianapolis, Ind
GOODYEAR TIRE & RUBBER CO., Akron, Ohio
MORGAN & WRIGHT, Detroit, Mich.
EMPIRE AUTOMOBILE TIRE CO., Trenton, N. J.
CONSOLIDATED RUBBER TIRE CO., New York City

N. B.—The extra cost of the BAILEY TIRES on the List more than smooth of same make is 2½ and 3 in., $1.50 each; 3½ in., $2.00 each; 4 in., $2.50 each; 4½ in., $3.00 each; 5 in., $3.75 each.



"Whitney" Chains

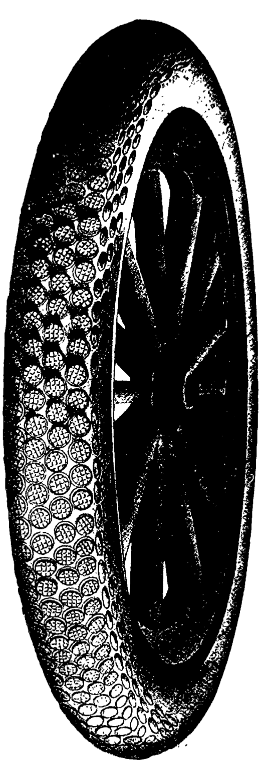
"WHITNEY" CHAINS are made in a modern fireproof factory and are used by the Leading American Makers of commercial and pleasure cars. A list of the cars driven by "WHITNEY" CHAINS will be furnished on application.



¶ The "Whitney" Patent Cotter Detachable Chain has made for itself a record which no other Detachable type has approached. It is favorably known from the Atlantic to the Pacific by jobbers, dealers and users. In an emergency a nail, wire or ordinary steel cotter can be used as a substitute for our special phosphor bronze cotter pins, but it would be difficult to find a substitute for any detachable locking device of special design.

THE WHITNEY MFG. CO.

HARTFORD, CONNECTICUT



Revision Up—or Revision Down—

Here is the question—before every motorist—day and night.

There are times when punctures, blowouts and other tire troubles seem to take particular delight in crowding a month full of tire expense items

This you know—if you have motored much. Haven't you had those items of tire troubles and tire expenses so bound up in your thoughts as to crowd out important business matters ?

Be honest Hasn't this often been the case? Haven't your nights been burdened with nightmares of tire difficulties when you ought to have enjoyed restful repose ?

But the place where you felt these difficulties and these expense items the most was when your monthly bill came in for new tires—for repairing old ones. My, how you dodged as if someone had hit you when you saw that bill sticking out of your morning's mail like a house afire !

If you had known a way to escape that bill you would have given considerable, would you not, for the peace of mind alone ?

And then—the aching void left in your bank balance—when a check had gone in full settlement

And scarcely before you realized it another month had rolled around. Another bill jumped at you from the day's mail

Same thing has been happening, with periodical regularity every month. Hasn't it ?

Now aren't you about ready to take a step that will mean relief ?

Relief—yes, we mean it

Relief—the very moment you step into your car until your trip is ended. Relief in knowing that your pleasure jaunt is not to be marred by tire breakdowns, goodness knows how far from nowhere

Relief—in your comfort—and in the comfort of your passengers

Relief—in the positive assurance that there are to be no punctures, no blowouts, no possible chance of skidding

Surely such relief is worth the while for you to experience Then—the relief in your expense account That question of tire expense is going to be revised downward Hitherto it has been going steadily upward

That greatest item of motoring—your tire up-keep—will become the least

And the way for all this relief—relief from mental strain—relief from excessive expense—is easy to secure. And it is before you, waiting, and ready for you to apply

The way is by the application to your tires of those tested tire protectors, time-tried and never found wanting

BRICTSON TREADS

(DETACHABLE)

For four years now they have been gaining in popular favor.

Starting as needs be at the very foot of the ladder they have climbed higher and higher in the esteem of motorists the world over. They have worked their way up—because of actual performance. Because they have always fulfilled our every promise

When we say—that they reduce tire expense—their use bears out our statement.

When we claim freedom from punctures blowouts, skidding —the user finds that these difficulties are no longer present when his tires are equipped with Brictson Detachable Treads.

When we say tire expense is revised downward—instead of upward—refer to your monthly expense bill at the end of one month's trial—it bears out our assertion.

Brictson Detachable Treads are made from the best grade of Chrome Leather With canvas lining, studded closely with specially tempered steel studs and steel rivets

Nowhere in their construction is there used inferior material.

Neither do Brictson Treads—depend upon artificial fasteners for their adherence to the rubber tire

Neither hooks, buckles, straps, wire fasteners in any shape or form, are used.

Construction of these Treads do not require it.

Application—is easy.

By simply deflating the tire, fitting the treads over the tire, tucking the edge between tire and rim and then inflating the tire to normal capacity, the trick is done.

They are put on nearly as quickly as it takes to describe the operation. Removed just as quickly.

Then you are ready to enjoy real motoring.

What about the effect on the tires ? some one says.

Well, the effect is to preserve the tires There is no danger of tires or treads creeping.

And no danger of rotting the tires

Tires protected for months and months at a stretch by Brictson Treads and sometimes for over a year without the removal of the tread, have shown no wear whatsoever

Brictson Treads take the abuse, the wear, the tear, that formerly the tire was obliged to accept.

Then the real mission of the tire is accomplished For the resiliency of the tire is not lessened one particle.

The tire performs its original function—of making motoring over all sorts of thoroughfares—a pleasure and not a bone-racking torment.

Appearance ? Please note we do not dodge any of the questions you might raise

Well, look at the actual illustration herewith given

Doesn't look like they would detract from the appearance of your tires or of your car—do they ?

And they won't.

The neatness of your car, if anything, is increased through the use of Brictson Detachable Treads.

The last item is that of initial expense

Brictson Treads cost about one-half of new rubber tires. You know that rubber tires are an uncertain commodity in price. Their tendency is up and up

Brictson Treads cost one-half and outwear from three to six new rubber tires of the very best makes you buy

Here, then, is the solution of the whole problem of tire expense.

Since one Brictson Tread outwears three to six new tires and costs but one-half, it is equal, is it not, to from six to twelve new tires ?

Four treads on your four tires are equal in efficiency—in results—to from twenty-four to forty-eight new rubber tires.

That's the answer.

What will you do about it ?

The way as we have shown is before you whereby a positive and decided reduction in tire expense may be secured.

Surely your next move will be toward revision downward and not upward

Ask today for our latest booklet, a booklet that states things as they are on the tire expense question

It handles this question to the point and without fear or favor

It sets forth in support of all of our claims the statements of actual users of Brictson Detachable Treads

And under their actual signatures.

This booklet—"The Enemy of Tire Expense"—is yours for the filling in and returning direct to us of the coupon herewith attached.

Do send this along right away Then the first step to tire revision downward you will have taken.

The Brictson Manufacturing Company

Box C. A.—12 **Brookings, South Dakota, U. S. A.**

Tear Coupon Off and Mail

The Brictson Manufacturing Company,
Brookings, South Dakota.

GENTLEMEN: Answering your advertisement in Cycle & Automobile Trade Journal for December 1, I am interested and desire to know more about how I can cut down the question of tire expense. Please send to me at once your latest booklet, "The Enemy of Tire Expense," and submit quotations. This request places me under no obligation to buy.

Name ____________________

Address ____________________

Name of car I use ____________________

C. A.—12.

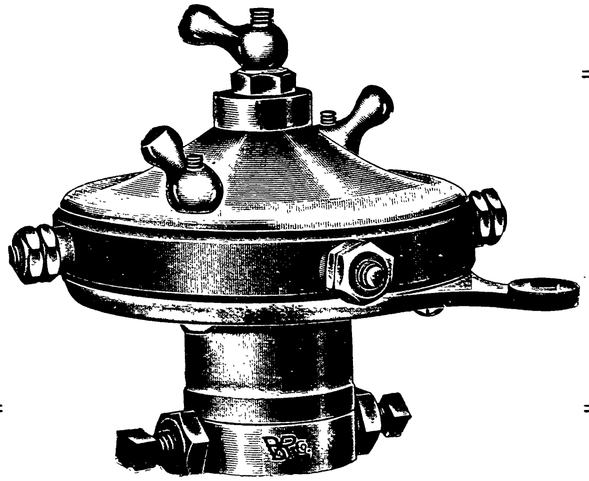
The MAXIMUS Makes Motors Mote

Over 12,000 satisfied users. If you are not one of them,
you should be; they save your temper, time and money.

PATENTED JUNE 2, 1908

More Speed

More Power



Less Plug Trouble

Less Coil Trouble

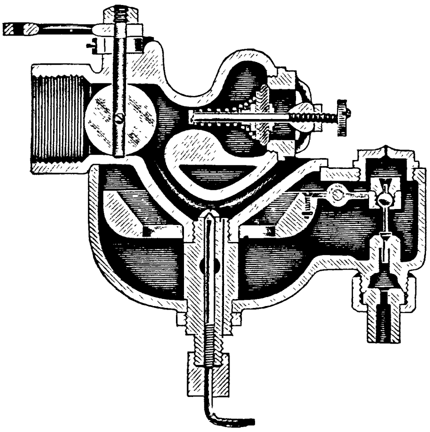
THE "MAXIMUS" TIMER

We know we have the best timer made, and that it will improve the speed, power and smooth-running qualities of your motor; if it does not, your money will be refunded without argument. 85 per cent. of 1908 model machines are equipped with roller type timers. The Maximus is constructed on the principle of the best of these, but has several improved features that overcome the weak points of roller-type timers, and make the motor mote. A special Maximus, designed to be easily applied to 2-cylinder Buick and Models M and N Ford is now ready for delivery.

The unprecedented success of the Maximus Timer encouraged us to experiment in carburetion, and, after careful testing and improving, we are now ready to offer

The MAXIMUS CARBURETOR

Simplified Carburetion



List Price

1-inch Size, $11.00

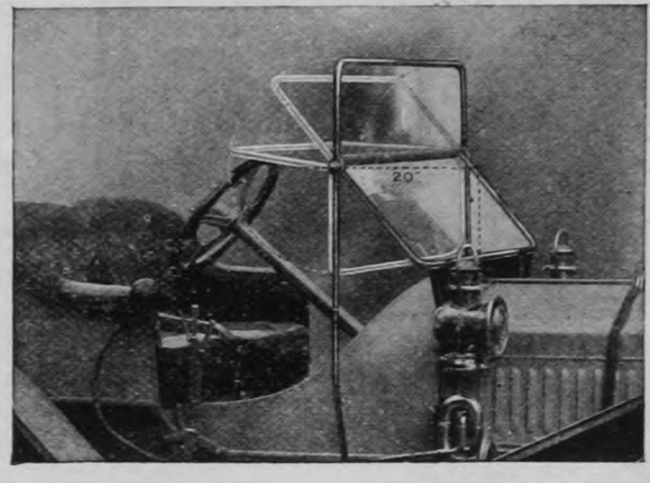
1¼-inch Size, $12.00

The principal feature is the improved method of applying both the constant and compensating air. The small opening for the constant air creates a strong vacuum on the nozzle, resulting in throttling to very slow speed and ease in starting. The method of applying the compensating air does away with the sudden increased rush of air on the spray nozzle at change of throttle.

MADE BY

The BECKLEY RALSTON CO., 80-82-84 Michigan Avenue, CHICAGO, ILL.

Motoring Comfort Depends
On Little Things



The petty annoyance of a poor equipment detracts from the pleasure of the trip. To stop to adjust your wind shield is one of the **unnecessary** annoyances.

The Friction Wind Shield

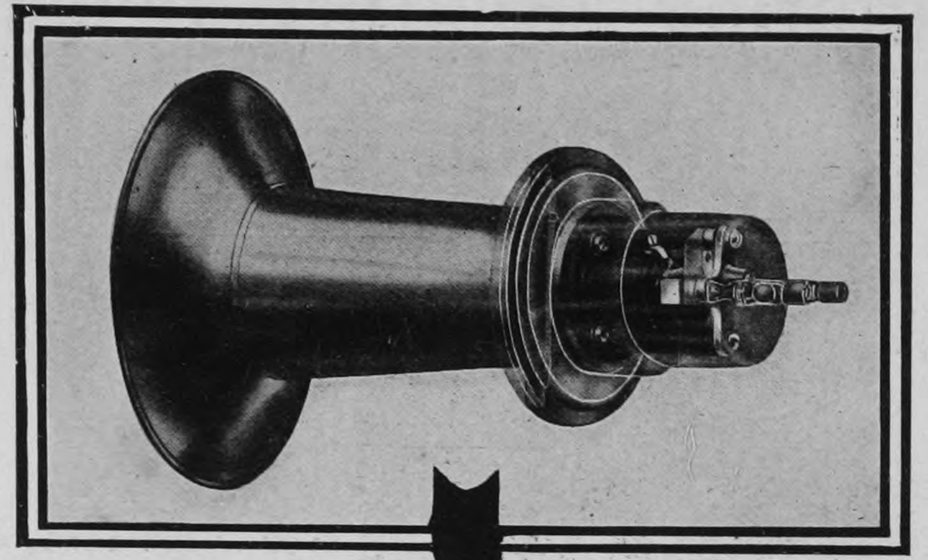
requires no stop, no effort—almost no thought to adjust. The motion is involuntary—as simple as throwing in a higher speed. No thumb-nuts, no springs or set screws—a touch of the hand operates it, and once set, it remains rigidly fixed in just the position **you** want.

The Friction Wind Shield is simple in construction—of brass tubing and the best grade plate glass—easy to clean and keep clean. May be attached to any car, and is worthy of the best. 6-inch, 9-inch, or 12-inch filling-in board as desired, furnished with each Shield.

Prices, 38-inch, $27.50 41-inch, $30.00
44-inch, $32.50

Write today for full information to

NEWARK RIVET WORKS



Examine the Mechanism

OF THE

Jones Electric Horn

¶ It is simplicity itself. No rotating motor to get out of order. Nothing to lubricate. No frequent adjustment—in fact NONE of the faults of the ordinary power-operated horn. The Jones Electric Horn ranks superior to every other automobile signal. One glance at its construction satisfies the most critical.

¶ Put a Jones Electric Horn on your car. There's a button on the steering wheel right under your thumb—you don't even move your hand because—"One touch of the finger does it." Instant beginning and cessation of sound and remarkably economical in current consumption.

Buy a Jones today! 3 Models
Prices, complete, $25 and $35

JONES SPEEDOMETER DEPT., UNITED MFRS., Inc.
Broadway and 76th Street, New York

Be the Judge in Your Case

You are the one most interested when the case of new bearings comes up.

The records show that the decision has invariably been given in favor of NON-GRAN High Speed No. 8 Bronze.

The most competent judge in rendering a decision is governed by the opinions of experts.

We have scores of letters from expert authorities on bearing metals in which they tell of their experiences with NON-GRAN Bronze. Their opinions will help you decide what metal you will specify for your new bearings.

Write us now, so you will be in a position to judge when the time comes.

All first class repair shops keep on hand a stock of NON-GRAN in Cored Bars. If your repairman is not stocked with NON-GRAN Bronze we should be pleased to serve you direct, or better still, send us his name.

Repairmen:—If your jobber cannot supply you, write direct to us.

AMERICAN BRONZE COMPANY, BERWYN, PENNSYLVANIA

TRUFFAULT

TRIU

NEW YORK TO PARIS RACE

1908

won by

THOMAS CAR

driven by Shuster

Car Equipped with

TRUFFAULT-HARTFORDS

SAVANNAH RACE

November 26, 1908

won by

FIAT

driven by Wagner

Car Equipped with

TRUFFAULT-HARTFORDS

VANDERBILT CUP RACE

1908

won by

LOCOMOBILE

driven by Robertson

Car Equipped with

TRUFFAULT-HARTFORDS

BRIARCLIFF CUP RACE

April 4, 1909

won by

ISOTTA

driven by Strang

Car Equipped with

TRUFFAULT HARTFORDS

START-FINISH

THE best evidence of the merit and necessity of Truffault-Hartfords is the fact that they are used regularly as equipment by the leading motor car manufacturers, including no less than the makers of the following well-known machines :

Pierce Arrow Chadwick Benz Studebaker-Garford Acme
Thomas Allen-Kingston Apperson Stevens-Duryea

SHOCK

HARTFORD

MPHS

GLIDDEN TOUR
1909
won by
GREAT PIERCE ARROW
Car Equipped with
TRUFFAULT-HARTFORDS

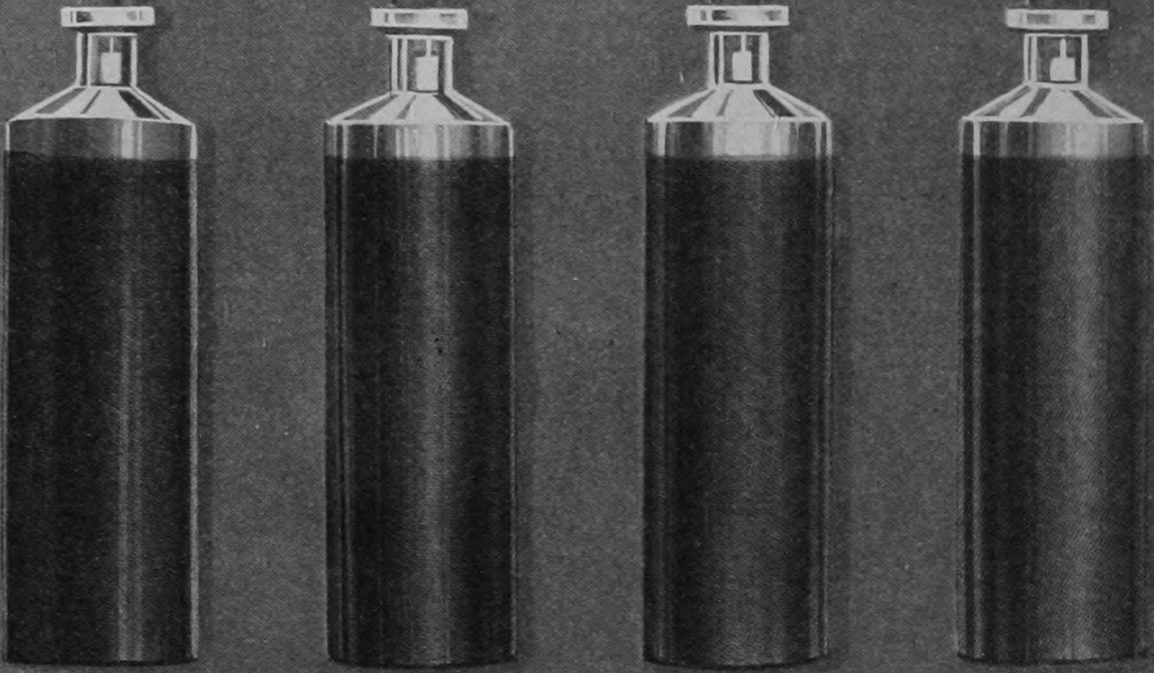
COBE TROPHY RACE
1909
won by
BUICK CAR
driven by Chevrolet
Car Equipped with
TRUFFAULT-HARTFORDS

LOWELL TROPHY RACE
1909
won by
SIMPLEX CAR
driven by Robertson
Car Equipped with
TRUFFAULT-HARTFORDS

24-HOUR RACE
at Brighton Beach
Oct., 1909
won by LOZIER CAR
driven by
Patschke & Mulford
Car Equipped with
TRUFFAULT-HARTFORDS

"INDISPENSABLE FOR COMFORTABLE MOTORING"

ABSORBER



HAVOLINE

¶ A cylinder oil is required to do two things (1) lubricate and (2) burn up cleanly.

¶ Any oil will lubricate if it has enough body, but very few will burn up cleanly—they contain too much carbon.

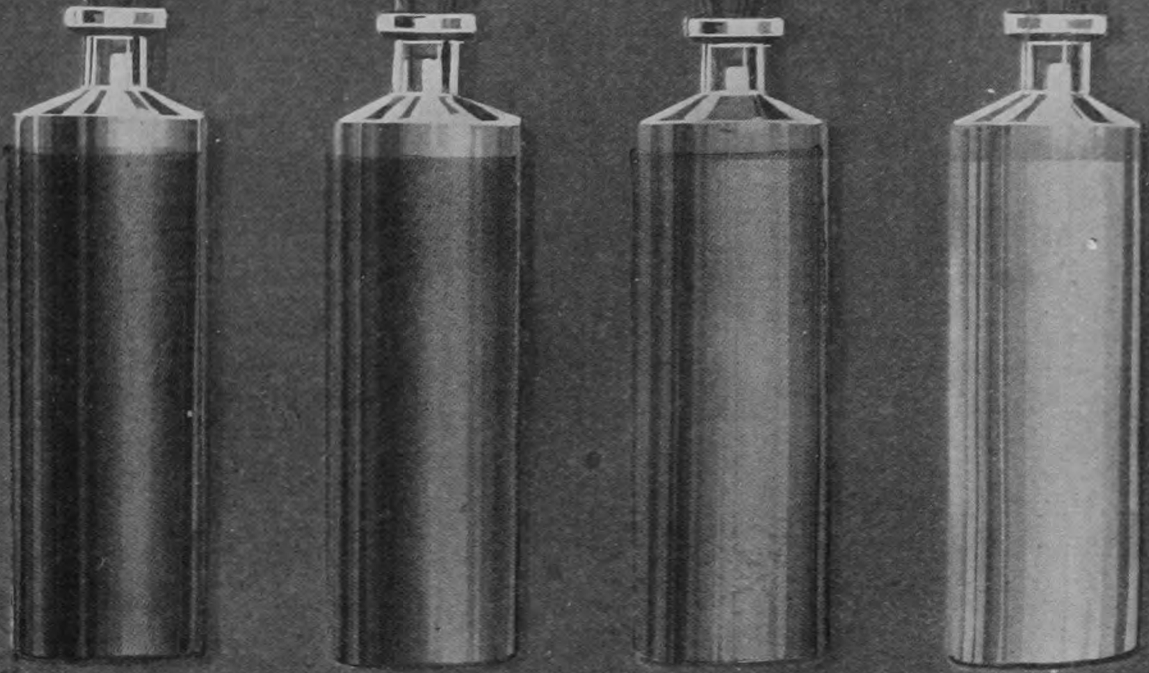
¶ Carbon is removed from oil by filtration, and the more completely an oil has been filtered the cleaner it will burn.

"IT MAKES A DIFFERENCE"

CHICAGO 40 Dearborn St
BOSTON 749 Boylston St
ST LOUIS 4630 Olive St

HAVOLINE
MOTOR
OILS

PACIFIC COAST AGENTS
W. P. FULLER & CO.
All Pacific Coast Cities



PURIFICATION

¶ The best oil is simply the one which has enough body to lubricate and has been most completely filtered.

¶ Just compare a sample of Havoline Oil with any other brand of oil in existence—you will quickly see a difference.

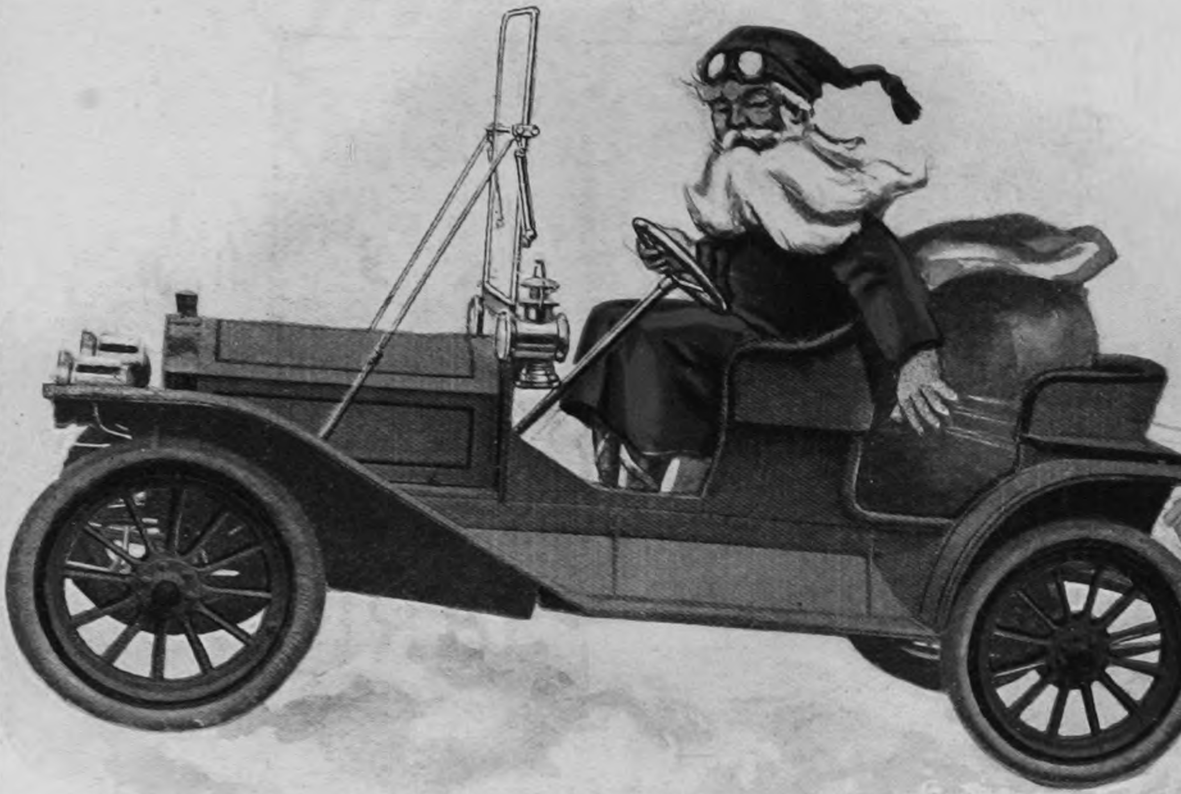
¶ Write for 1910 catalogue and price list, sent postpaid upon request.

HAVOLINE OIL COMPANY

Executive Offices:
75 Broad Street
NEW YORK

HAVOLINE
MOTOR
OILS

Retail Store:
1906 Broadway
NEW YORK



THIS YEAR'S BEST GIFTS TO MOTORDOM

Emil Grossman Company

874 WOODWARD AVE
DETROIT

232 W 58TH ST NEW YORK

1436 MICHIGAN AVE
CHICAGO

The Hydraulic SHIELD

Red Head
SPARK PLUG
and
RED RIB
CABLE

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Soap Smiles

Ask the man who has tried them all and he'll tell you "Buckeye" is without question, the **best, most satisfactory** and **most economical** Auto Soap he ever used. He'll tell you he is delighted with it, makes him smile to see how it brings out the lustre of his car and makes it look like new.

It Pays to Use Good Soap

Good soap is **cheap** at any price. Cheap soap is expensive even as a gift. The quickest route to the paint shop is the "Cheap Soap" route and painters' bills come high. You can't be too critical of the soap you use on your car. Get one you know positively will not injure the finish of your car—one you can depend on—**then stick to it.**

"Buckeye Cleanser"

Preserves the Finish

Not a trace of alkali in it. Its linseed oil properties give the surface the life it needs to keep the paint from cracking and prolong the life of the finish.

It's a pure linseed oil soap—lathers freely and restores the original lustre.

Sold in Six Different Packages

"Buckeye" is put up in six different size packages from 5-l pails to 450-lb. barrels.

5 lb. pails		Kegs,	125 lbs.
10 "	"	Half bbls.	225 "
25 "	"	Barrels,	450 "

To the Car Owner

We want you to buy "Buckeye." After you do, you'll not be satisfied with any other soap. You'll see at once the difference. If your dealer hasn't "Buckeye," write us.

To Dealers and Garages

"Buckeye" will cut down your soap bills, for it does more work, pound for pound, than any other.

Distributed from 40 Warehouses

The J. P. Davies Company
DAYTON OHIO

STOP! LOOK! LISTEN!

MIDDLEBY

Four-Cylinder
25 Horse Power
Air-Cooled Motor

The MIDDLEBY cars, which have given such perfect satisfaction during the season of 1908-09, and cost less to maintain than cars at double their cost, are so much improved for 1910 in construction and finish that they will prove quick sellers and among the easiest running cars manufactured. ¶ Before purchasing or securing an agency, write for our catalogue describing our latest models:—

Touring Car, -	**$1250.00**	**Single Rumble,**	**$1000.00**
Toy Tonneau, -	**1250.00**	**Surrey Type, -**	**1000.00**
Double Rumble,	**1100.00**	**Runabout, - -**	**850.00**

LIVE AGENTS WANTED

MIDDLEBY AUTO COMPANY

READING :: :: :: PENNA.

Half a Million Dollars More to Clinch the Leadership of

THE Detroit ELECTRIC

We have recently invested half a million dollars more in adding to our already unequalled facilities.

This latest acquisition is the plant at Cleveland of the Elwell Parker Electric Company. Here will be built in future all the power plants for Detroit Electrics.

The importance of this to you, if you are a prospective buyer of an electric, will be instantly apparent.

Here is an electric carriage whose every moving part is in perfect operating harmony with every other, for the simple reason that each is manufactured with precise relation to every other.

It is impossible to secure perfect fit and perfect accord if motors are built here, gears there, frames elsewhere, and bodies at still another distant point.

The absorption of the Parker plant was the last step which makes this announcement possible.

No other maker produces, as we do, every part of his carriage — motors, gears, frame, body, upholstering.

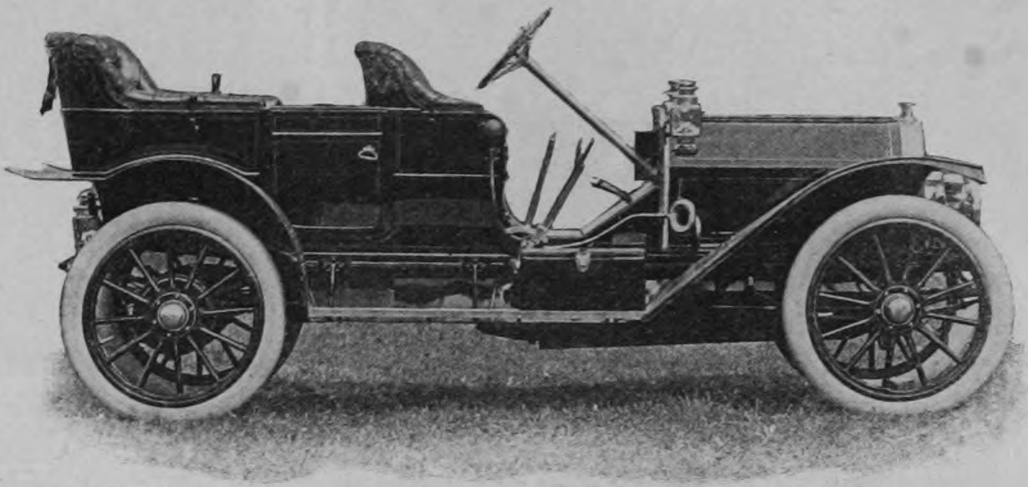
In elegance, dignity and style, in luxury of appointment and upholstery—in mileage and speed and all the other attributes desired by the electric owner—the Detroit easily excels.

The Detroit was the only electric that attempted to cover the route of the Munsey tour, finishing without breakdown or repair and in perfect condition, over roads which racked the gas cars so severely that but one perfect score was made.

Write for the literature descriptive of the superb 1910 models.

Established, Responsible and Energetic Dealers Wanted

AUBURN



Model X—$1650.00

The Auburn Way—The Best Ever

¶ This is what you hear from every one who has seen the new "40." All we ask is that you compare this car, point by point, with any car you may have in mind.

¶ It's the most for the money you are looking for; that's what the AUBURN "40" is—the greatest automobile value for the price.

¶ **QUALITY** and not quantity is what we are striving for; what cars we do build will be built right.

¶ The models include Touring Cars, close-coupled baby tonneaus, Roadsters with single and double rumble seats. The bodies have a particularly snappy appearance.

¶ **SOME OF THE FEATURES:** Four cylinders cast separately; five-bearing crank shaft; 36″ wheels; "I" beam front axle; live rear axle; brakes positive and reliable with evener equalizers; Hess-Bright ball bearings in the transmission; semi-elliptic front, full elliptic rear springs.

Magneto.
Selective transmission, three speeds and reverse.
Self-contained system of lubrication.
Double-acting internal and external brakes.
116″ wheel base.
Non-reversible worm and wheel steering gear.
Multiple disc clutch.
Pressed steel frame throughout.
Shaft drive with bevel gear differential.
Universal joints between motor and clutch and between transmission and differential.
Painted in a rich shade of dark blue with fine line gold stripe.
Standard equipment is two side oil lamps, tail lamp, tools and magneto.

¶ The two-cylinder car which lists as model G, at $1250.00, is continued for 1910 without the change of a bur or bolt, having proved so satisfactory everywhere, and demonstrated our claim: The Best car of its type on the market at any price.

YOU CAN'T GO WRONG IN BUYING THE AUBURN

CATALOGS READY

AUBURN AUTOMOBILE COMPANY

AUBURN, INDIANA

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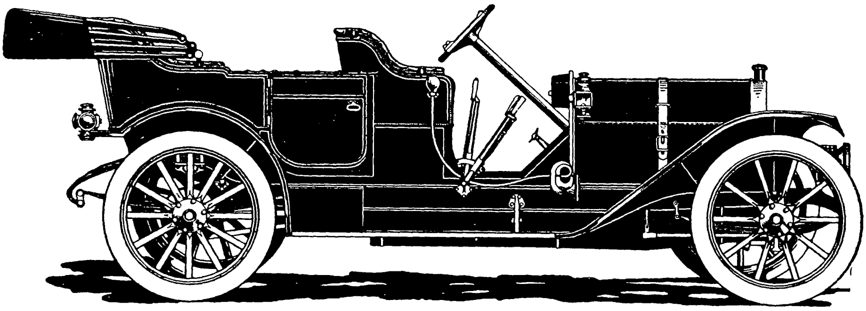
TRADE **KLINE KAR** MARK

The Master Work of a Master Designer



Model 6-40, 40-50 H. P., 6 Cylinder, 5 Passenger Touring Car, **$2,500**

The design of to-morrow is found in the Kline Kar of to-day

? What Do You Think of This ?

A 6-cylinder 40-50 H. P. Touring car, Toy Tonneau or Roadster, made from the best material and workmanship obtainable, with 123-inch wheel base, 36-inch wheels. Two separate systems of ignition, including Bosch magneto and Connecticut single unit coil, with the switch located on steering wheel, for

$2,500

Keep This Fact in Mind

We made the KLINE KAR first and set the price afterwards. Not one item that goes into the different models has been selected because of price. Quality and fitness are the determining factors.

Write for detailed information about the KLINE KAR—a new car by an old designer.

MANUFACTURED BY

BCK

MOTOR CAR CO.,
YORK, PA.

Write Dept. A for Information, Territory and Prices

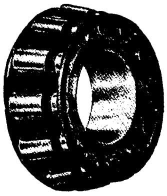
TIMKEN BEARINGS SHORT SERIES

TIMKEN SHORT SERIES BEARINGS can be used in the same space required for ball bearings, yet affording easy and instant adjustment at all times.

This added advantage over all other types of bearings has been the cause for many of the largest manufacturers of high grade cars to replace ball bearings with

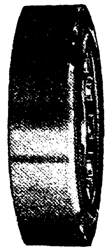
Timken Roller Bearings

in full or in part this season. And this is only one of the many distinctive features that have made manufacturers recognize the *Timken Principle* as being correct and appreciate *Timken Quality*.



The Timken Roller
Bearing Co.

CANTON, O.



DIETZ "HANDY" GENERATORS

¶ The gas-generating capacity of Dietz "HANDY" Generators is amply sufficient for all the lights on a car, and if burned in one flame with an adequate burner tip, the generator gas would show a surprising candle power.

FURTHER:

The "HANDY" Generators are simple — four parts only. Square and round models, 2 lb. and 3½ lb. carbide capacity.

$9.50 and $12.50 List

Usual Trade Discounts

We make an interchangeable burner for Acetylene gas in oil lamps, the DIETZ "Presto."

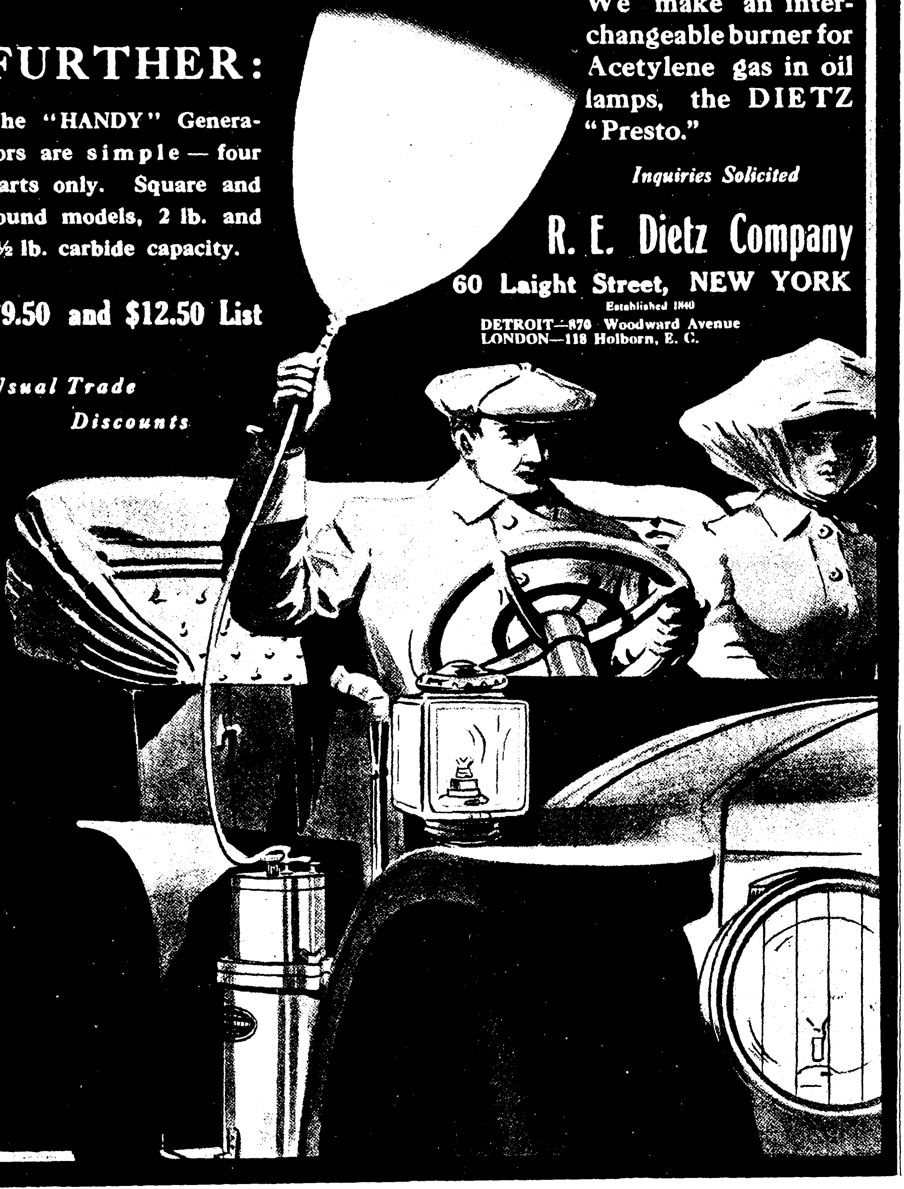
Inquiries Solicited

R. E. Dietz Company

60 Laight Street, NEW YORK

Established 1840

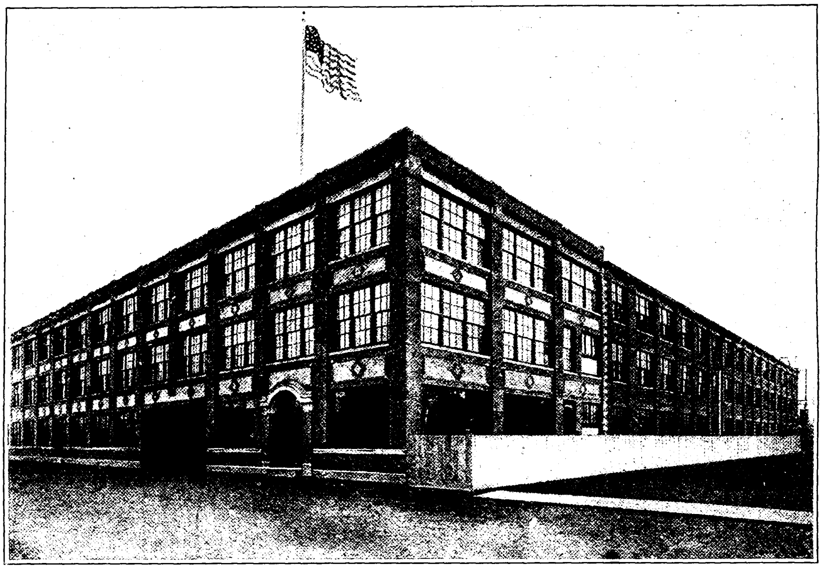
DETROIT—870 Woodward Avenue
LONDON—118 Holborn, E. C.



75,000 Radiators

PER ANNUM

and here is the proof



Detroit's newest factory, completed October 1st

Radiators
Fans
Lubricators
McKim Gasket

McCord Manufacturing Co.

Detroit

New York, 50 Church Street **Chicago, Old Colony Building**

HARTFORD TIRES

THE HARTFORD CLINCHER TIRE
WIRE GRIP
NON SKID

TRADE MARK

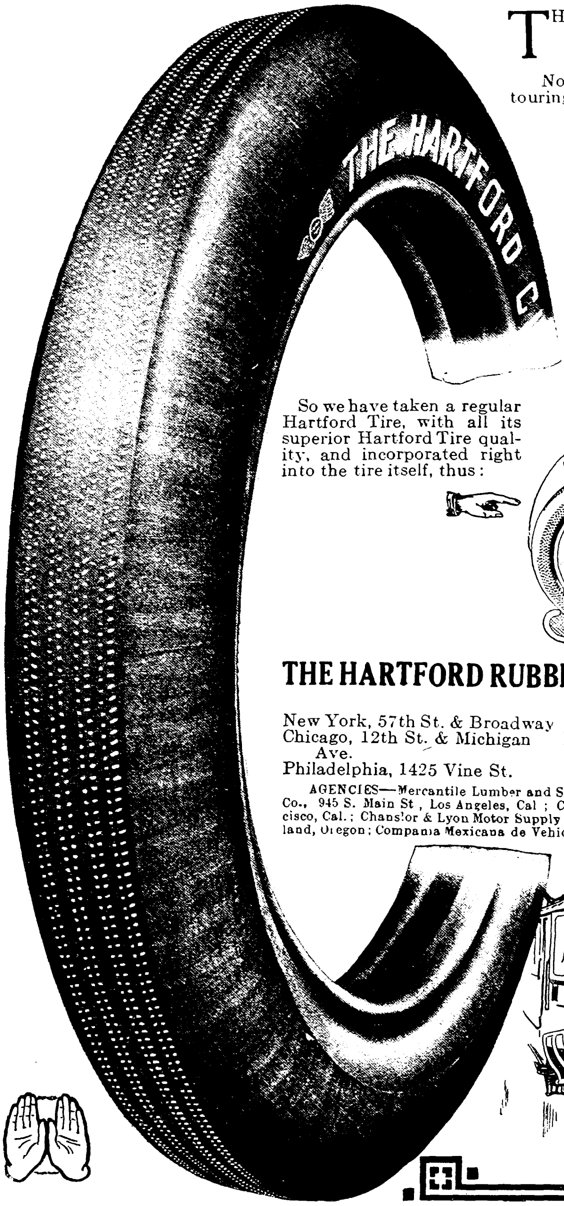
(MIDGLEY PATENT)

Most Non-Skid Devices Spell Rack and Ruin to the Car

THE tire makers' problem in making a non-skid tire is to make it non-skid and still retain resiliency; because resiliency is absolutely necessary to the welfare of the car.

No owner would think of running an expensive limousine, touring or other valuable car on solid tires, yet many do use non-skid devices which are every bit as hard on the car.

There's only **one** non-skid incorporated into the tread of the tire itself that is really resilient and non-skid, and that is



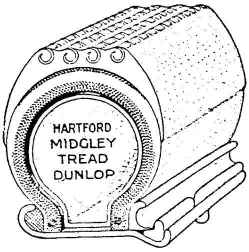
The Hartford Wire-Grip Non-Skid Tire

(MIDGLEY PATENT)

A pneumatic rubber tire with smooth tread or with any combination of rubber projections, corrugations, indentations, or angles **will slip** on wet asphalt.

To make a tire skid-proof, **metal** must positively come into contact with the road.

So we have taken a regular Hartford Tire, with all its superior Hartford Tire quality, and incorporated right into the tire itself, thus: four heavy coils of specially made, specially treated steel wire. Those steel coils coming into contact with the road's surface, the rounded coils wear through, becoming thousands of little spikes that grip the ground like cat's claws, although they do not detract materially from the resiliency and fastness.

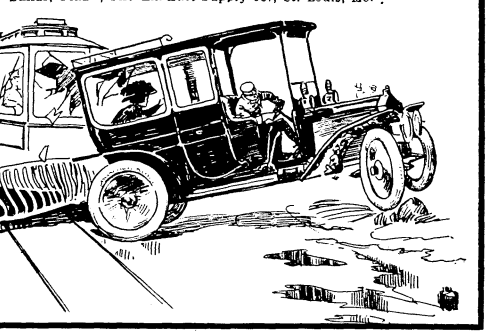


THE HARTFORD RUBBER WORKS COMPANY, Hartford, Conn.

BRANCHES

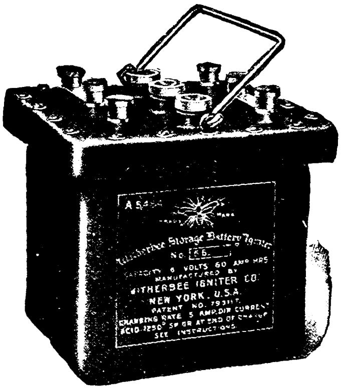
New York, 57th St. & Broadway
Chicago, 12th St. & Michigan Ave.
Philadelphia, 1425 Vine St.
Boston, 817 Boylston St.
Detroit, 256 Jefferson Ave.
Denver, 1564 Broadway
Atlanta, Ga., 94 N. Pryor St.
Buffalo, 725 Main St.
Cleveland, 1831 Euclid Ave.
Minneapolis, 622 Third Ave.

AGENCIES—Mercantile Lumber and Supply Company, Kansas City, Mo.; Chanslor & Lyon Motor Supply Co., 945 S. Main St., Los Angeles, Cal.; Chanslor & Lyon Motor Supply Co., 501 Golden Gate Ave., San Francisco, Cal.; Chanslor & Lyon Motor Supply Co., 2001 Second Ave., Seattle, Wash.; F. P. Keenan Company, Portland, Oregon; Compania Mexicana de Vehiculos, City of Mexico. Mex.; Jos. Woodwell Company, Pittsburg, Pa.; The Southwestern Automobile Supply Co., 351 Commerce Street, Dallas, Texas; Phoenix Auto Supply Co., St. Louis, Mo.



WITHERBEE BATTERIES

for Illumination


Witherbee Storage Battery Ignitor
No. 56
6 VOLTS 60 AMP HRS
MANUFACTURED BY
WITHERBEE IGNITER CO.
NEW YORK, U.S.A.
PATENT NO.
CHARGING RATE 5 AMP. DIR CURRENT
SEE INSTRUCTIONS

THOSE who have used Witherbee batteries for ignition need no introduction to this famous accumulator. Now that everyone is turning to electricity for side lights, tail lights, head lights and interior lighting, remember that for service the Witherbee Battery has no equal.

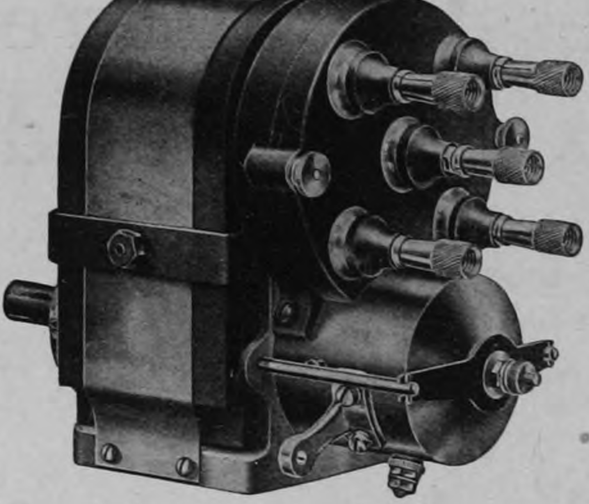
Send for "A Hole in the Dark"

A little booklet which will tell you everything you want to know about converting lamps for electricity, wiring, etc.

Witherbee Igniter Company

Springfield, Massachusetts

BRANCHES:—New York, 1876 Broadway; Chicago, 1429 Michigan Ave.; Detroit, 220 Jefferson Ave.; Baltimore, 422 N. Charles St.; Buffalo, 41 E. Eagle St.; Coast Representative:
Moore Motor Supply Co., San Francisco, Cal.



Announcement to

Manufacturers

LATEST!
BEST!
SUPERIOR!

Kurtz

HIGH TENSION MAGNETO

At the request of the Hess-Bright Mfg. Co. we have changed the name of our Magneto from Hess to Kurtz

LATEST—Because it is.

BEST—Because we can produce a *hotter* spark at a *lower* speed· Our *armature* has *improvements* not found on any other Magneto. Has *one-third* less parts than any other Magneto which means simplicity and of course increases the reliability. Constructed under our *original* patents, by which method we can reduce the number of parts as well as increase the efficiency.

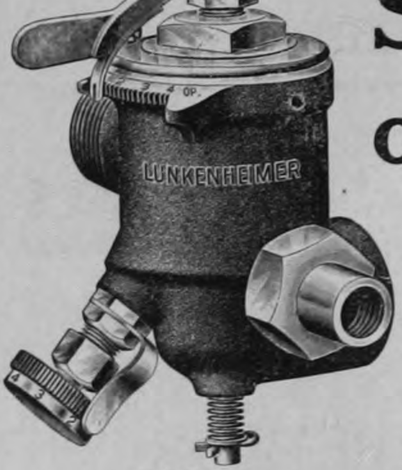
SUPERIOR—Because it stands higher in efficiency and reliability. We can *afford* to sell cheaper not by giving you something inferior, but can do it only by using our *patented construction,* and reducing the parts and complications to a minimum.

We have the largest line of Magnetos on the market. We *actually sold more* Magnetos for 1908 than any other concern A strictly American product, guaranteed to have the efficiency and quality of the best on the market.

We are offering nothing freakish. Built on established principles. Efficiency and durability our one aim.

HERCULES goods sold absolutely on their merits. Write Dept. "H. T."

HERCULES ELECTRIC COMPANY

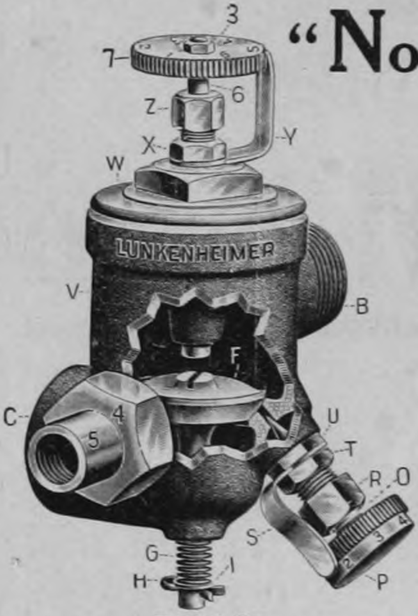


TYPE A
With sliding throttle controlling the outlet passage. No regulation for lift of disc

Successful where others have failed

Gasoline Engines that could not be made to work satisfactorily have given results when equipped with

Lunkenheimer
"Nonpareil" Generator Valves



TYPE B
With regulation for lift of disc. No throttle valve

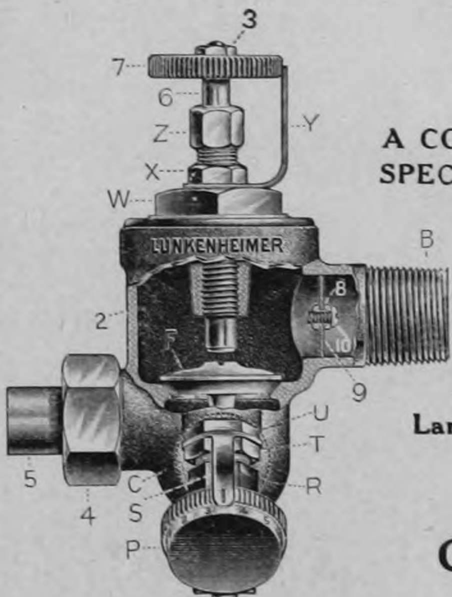
The material is of the very highest grade, and the discs are made of an extremely strong bronze composition, the tensile strength being about 5000 pounds per square inch.

Lunkenheimer "Nonpareil" Generator Valves are absolutely reliable, exceptionally durable and will positively give satisfactory results if properly connected and regulated.

They are made in a variety of styles and in sizes from one-half to two inches, inclusive.

YOUR LOCAL DEALER CAN SUPPLY THEM. IF NOT, WRITE US

A COPY OF OUR AUTOMOBILE AND MOTOR BOAT SPECIALTY CATALOGUE WILL BE SENT UPON REQUEST. IT'S FREE

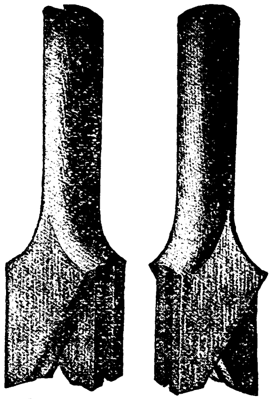


THE
Lunkenheimer Company

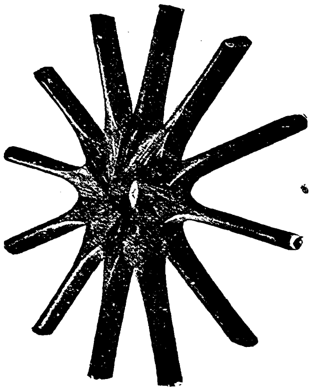
Largest Manufacturers of High-Grade Engineering Specialties in the World

GENERAL OFFICES AND WORKS
CINCINNATI, OHIO, U. S. A.

THE
Schwarz Wheel
FOR
Automobiles and Heavy Vehicles



Schwarz Patent Spoke



Spokes Compressed

The only wheel with absolute spoke support. The spokes at the tenons are grooved and mortised for interlocking and are put together at one time under pressure, insuring trueness. **They can never work loose.** When put together they form a compact, immovable assemblage and the wheel may be completed with metal rim for tire and shipped without a hub.

The Best and Strongest Artillery Wheel Made

Send for illustrated booklet.

☞ These are some of the cars equipped with Schwarz Wheels, because they are the best to be had:

Peerless, Winton, Packard, Cadillac, Lozier, American Locomotive, Premier, Crawford, Matheson, Stearns, Thomas, Apperson, Baker Electric, Columbus Buggy Electric, Fritchle Electric, Atlas, Chadwick, Autocar, Sultan, Grout, Acme, Mack Truck, Hewitt Truck, Gaeth, Mora, Frayer-Miller, Marmon, Selden, Oscar Lear Truck, American Motor Truck, Lansden Truck, Knox, Garford, Mason, Walter, Napier, Tincher, Rauch & Lang Electric, Reliance Truck, Maxwell, Croxton-Keeton, Simplex, Studebaker, Broc Electric.

The Schwarz Wheel Co.
Philadelphia, Penna.

ALCO

WINS

VANDERBILT CUP

And never was a victory won more strictly on merit.

CONSIDER THIS

The ALCO car that won was a **6-cylinder, 60 H. P. Stock Model. It is the first 6-cylinder car that ever won a big race.** Its average speed for the 278 miles was 62.8 miles an hour. This was on a course just half the size of former ones, with twice as many turns. This made it the **most bruising of all races,** and that is why so many cars were killed off. In former years racing cars of much higher power were used, yet only once was faster time made.

The ALCO car ran fastest towards the finish when the pace proved too hard for the others. The final lap was its fastest. Its average for the last four laps was 70.44 miles per hour. The car had no mechanical trouble and is ready now to repeat the little run. It was a user who first said—

"It Stays New"

AMERICAN LOCOMOTIVE CO.

1886 Broadway :: :: NEW YORK

FOR SAFETY AND SERVICE

Eighty per cent of the high-grade cars made in America ar equipped with Solar Lamps.

These cars are sold on quality. The makers could buy lamps at less price than they pay for Solar quality, but they realize that there only one lamp whose presence would not cheapen the car itself.

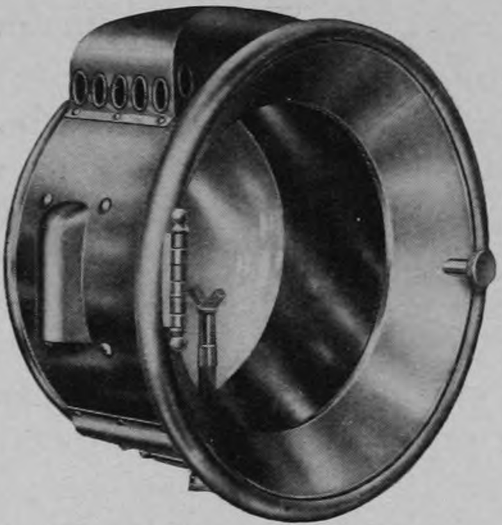
They know that the motorist who desires the utmost in qualit reliability and beauty must inevitably turn to Solar Lamps.

Solar Lamps contain fewer parts than any others. The mai body of each headlight is one piece of heavy gauge drawn brass, an the parts are assembled by interior screws, producing a perfectl smooth exterior surface, easy to clean. All parts are interchangeabl

All headlights are equipped with the special short focus lead glas B. & L. Solar lens mirror, the finest and most efficient made.

Solar quality is maintained in the Solar side and tail lamps, th Solar generators, and the entire line.

Every Solar Lamp has a model number stamped on it. By quoting this any part desired can be immediately replaced from the factory



Solar Omega Headlight

Model 1076—Price, $ 9.00
Model 1077—Price, $10.00
Model 1078—Price, $13.75
Model 1079—Price, $18.75

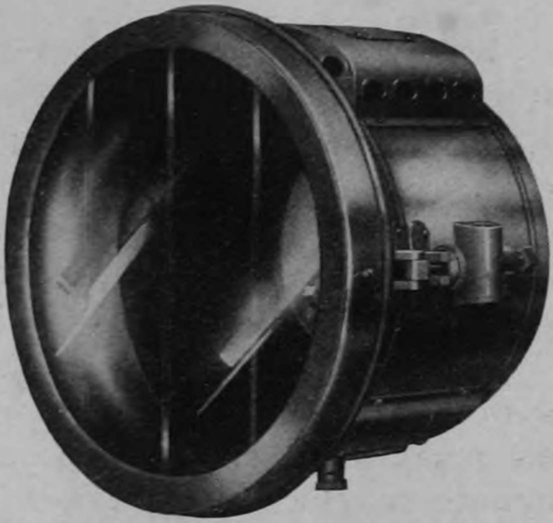
Solar Senior Electric and Oil Tail Lamp

Model 905—Price, each, $3.50
Model 906—Price, each, $5.00

IT MUST BE A SOLAR

Solar Electric and Oil Side Lamp

Model 1032C—Price, per pair, $12.00
Model 933C—Price, per pair, $15.00
Model 935C—Price, per pair, $20.00



Solar Lens Mirror Searchlight

Model 956A—Price, $ 7.50
Model 957A—Price, $ 9.00
Model 958A—Price, $12.00
Model 859A—Price, $17.50

Our aim is not to build a lamp as cheaply as we can, but to build as good a lamp as we know how, and sell it as cheaply as we can.

Every Solar Lamp, from the largest headlight to the smallest tail or side lamp, represents the very best materials and workmanship it s possible to use in that particular lamp.

We are the only concern in the country making a complete line of amps and generators for all automobile, bicycle and mo or boat uses. No other plant, therefore, is anywhere near as well equipped to give atisfactory service along all lines.

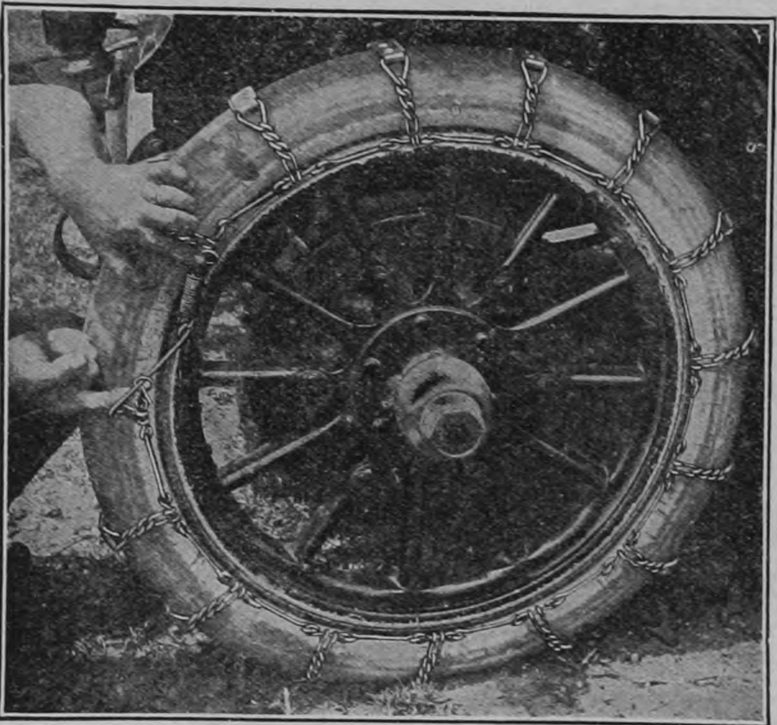
Besides, our immense output enables us to reduce manufacturing and overhead expense to the minimum.

As a consequence, we are able to offer a far better lamp than is possible to competition ; and in many cases at even a less price than s charged for common lamps.

Send for complete catalog.

N. B.—We have something special under way. It will be ready for the New York show. Watch for it.

TRAVER NON-SKID DEVICE



Does not cut th
Tire

Cannot Skid

Always Fits Snug
on the Tire

Outlasts all Others

Does not Cost any
more

The secret of the efficiency o the TRAVER NON-SKID DEVICE lies in the spring shown in the illustration. It takes up al motion, and no matter how great the strain on the chain it will always keep its original adjustment.

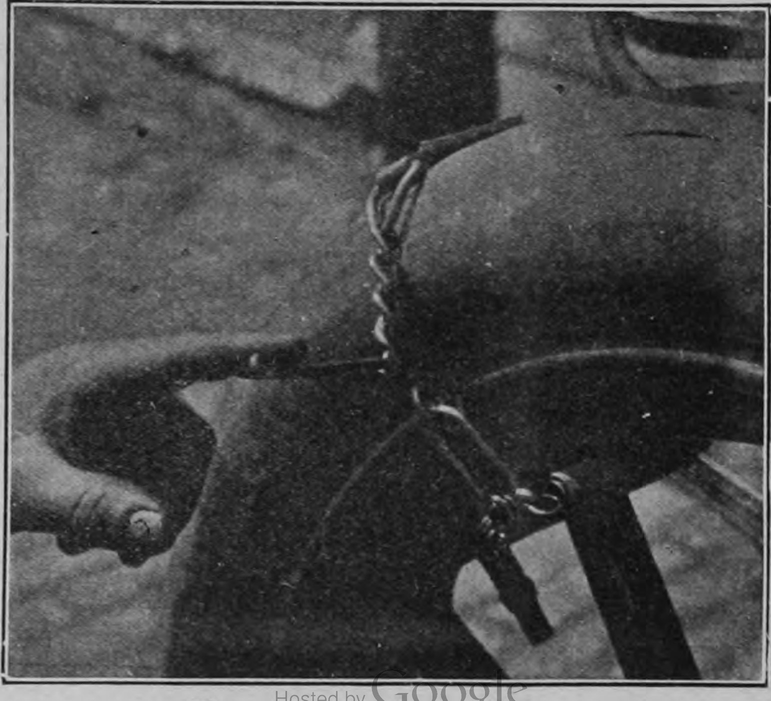
Another good feature is the case-hardened plate system. They have a long wearing surface and are flared at the edges so that no sharp point or edge touches the tire anywhere.

THE TRAVER NON-SKID DEVICE may be adjusted "quick as a wink."

Price, per set complete, packed in strong canvas bag, from $5.00 to $11.00, depending on size of tire.

FULLY GUARANTEED

Call to see the TRAVER NON-SKID at your dealer's, or write for further particulars to



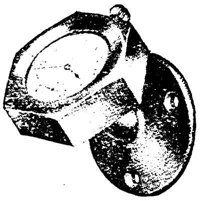
Traver Non-Skid Sectional Device

The Motor Car Equipment Co.

Get Our Prices Before Placing Your 1910 Orders

Buy from us and you will laugh at mail order competition. We enable you to undersell them and make good profit. Our prices are surprising. Let us show you.

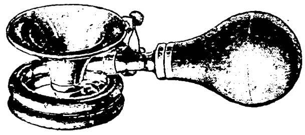
Offset Clocks



Every conceivable design in stock. Clock like above in brass, bronze or nickel. One day only. A thoroughly reliable timepiece.

No. 513. Retail Price, $2.00

Horns

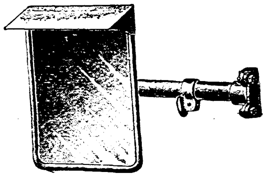


We have the largest variety of horns in the country. This is our Motor Cycle Horn. Fine sounding. Brass only.

No. 10. 3¾-inch Bell, Retail Price, $2.25

No. 11. 4-inch Bell, Retail Price, $3.00

Argus Mirrors

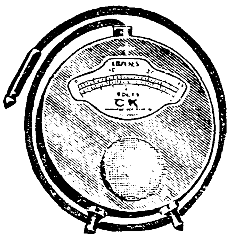


Every limousine car must have an Argus Mirror. It prevents accidents. Glasses can be replaced in these. Order some now.

Retail Price, with hood, $7.00

Retail Price, less hood, $6.00

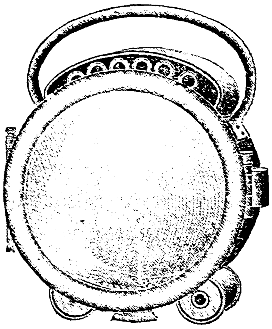
Ammeters



These inexpensive, accurate ammeters and voltmeters are good sellers.

C. K. Ammeters, Retail, $2.00
C. K. Voltmeter, Retail, $2.00
C.K. Volt Ammeter, Retail, $2.75

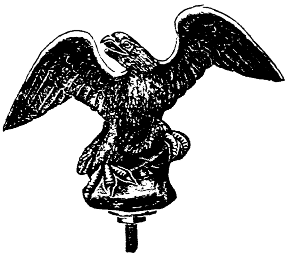
Double Lens Headlights



The best selling and most powerful headlight on the market. More powerful than a searchlight.

No. 302M. 11-inch high, Ret. Price, $18 00
No. 301M. 13-inch high, Ret. Price, $27.50

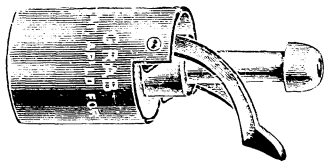
Radiator Emblems



We have the kind that sell. Gobbos, Eagles, Elks, etc. Good profit handling them. This is our Eagle, No. 5233. Size, 3½ inches high. Gold finished.

Retail Price, $1.50

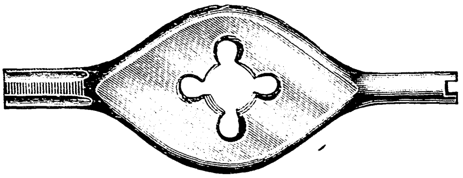
Grab Pump Connections



There is a tremendous demand for these. They clamp on. No screwing to be done. We help you sell them.

Retail at 25c. each

Improved Valve Taps and Dies



Best of all valve taps and dies. One piece of drop forged steel. Cannot wear out. Three in one. Repairs any valve. **Retail at 25c. each**

DEALERS!—Write for our Trade Discounts. It will save you money. We are exclusively wholesale, and do not sell retail.

55 Warren St. New York City New York

The Motor Car Equipment Co.

The Neverout

TRADE MARK

Patent Air-Cooled Acetylene Generator

1910 MODEL

This Generator is Built to Generate Acetylene Gas, and not merely to Sell

Note the patent air-cooling system, giving the whitest light known.

PRICE

$15

Complete

The Neverout

REGISTERED TRADE MARK

Fastens directly to running-board

PATENTED

Patented in the U. S. and Principal Foreign Countries

Good enough for the $5000 car and not too high-priced for the car that sells for $500. **Strictly Guaranteed.**

Back of every Neverout Lamp and Generator stands a positive guarantee of "Satisfaction or money back." Back of that guarantee stands a company whose integrity, faithfulness and actual performance are well known throughout the world. Write Today for Catalog.

Rose Manufacturing Company

911 Arch Street, Philadelphia

CYCLE AND AUTOMOBILE TRADE JOURNAL

Vol. XIV, No. 6 **PHILADELPHIA** **DECEMBER 1, 1909**

NOVEMBER EDITION, 23,675

18,327	Copies mailed at pound rates.
7,206	Copies delivered to News Company.
579	Copies to Philadelphia and foreign, etc., under stamps.
2,400	Copies to Atlanta, Ga., Show.
50	Copies held in reserve.
28,562	
4,887	Back numbers sent out.
23,675	Total copies of November edition. Of these
13,733	Were paid subscriptions.
7,206	Delivered to News Company.
20,939	
1,015	Returned by News Company to November 13, 1909.
19,924	Net total paid.

We print on this page each month an exact statement of the number of copies printed and distributed of the preceding issue of "The Cycle and Automobile Trade Journal."

The bindery count of actual complete copies produced of the November issue was 23,675.

Of these, 24,054 pounds were mailed at pound rates, as shown by post office receipts. Each copy weighs 21 ounces, representing 18,327 copies, and 4,887 copies of back numbers and copies returned by news companies are accounted for, in addition to the total for the month.

We will be pleased to verify the above figures at any time to anyone interested.

COMING EVENTS

American.

December 29-30—Fourth Annual Mid-Winter Endurance Contest, under direction of the Quaker City Motor Club.

December 31-January 7—New York City, Grand Central Palace, Tenth International Automobile Show. Under the management of the American Motor Car Manufacturers' Association with the Importers' Automobile Salon and the Motor and Accessory Manufacturers. Alfred Reeves, General Manager, 505 Fifth avenue, New York City.

January 8-15—Tenth Annual National Automobile Show in Madison Square Garden, New York, under the auspices of the Association of Licensed Automobile Manufacturers.

January 10-16—Annual Automobile Show in Portland, Ore.

January 17-22—Annual Automobile Show of the Automobile Trade Association of Philadelphia, in the Third Regiment Armory, Broad and Federal streets.

January 24-29—Annual Automobile Show in Convention Hall, Washington, D. C. B. C. Washington, Jr., Manager.

January 24-29—Third Annual Automobile Show in Detroit, Mich., under direction of Detroit Automobile Association.

February 4, 5, 6—Annual Mardi Gras Speed Carnival, New Orleans, Automobile Club, New Orleans, La. Homer C. George, Manager.

February 5-12—Ninth Annual National Automobile Show in Chicago under the auspices of the National Association of Automobile Manufacturers.

February 14-19—Eighth Annual Buffalo Automobile Show at the Broadway Arsenal, under the auspices of the Buffalo Automobile Club. Dai H. Lewis, Secretary.

February 14-21—Annual St. Louis Automobile Show in the National Guard Armory.

February 19-26—Annual Newark, N. J., Automobile Show in Essex Troop Armory, under the auspices of Associated Automobile Clubs of New Jersey.

February 21-26—Annual Automobile Show of the Binghamton, N. Y., Automobile Club.

February 22-26—Fourth Annual Automobile Show in Convention Hall, Kansas City, Mo.

February 22-26—Second Annual Automobile Show in Auditorium, Milwaukee, Wis., under auspices of Milwaukee Automobile Club.

March 5-12—Eighth Annual Automobile Show in Mechanics' Building, Boston, under direction of the Boston Automobile Dealers' Association.

April 30-May 1, 2—Roadability Run, Quaker City Motor Club, Philadelphia, Pa.

June 4—Spring Track Meet, Quaker City Motor Club, Philadelphia, Pa.

August 6—Mid-summer Track Meet, Quaker City Motor Club, Philadelphia, Pa.

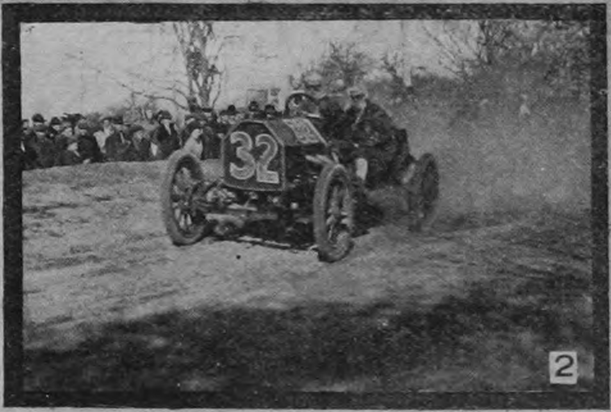
Foreign.

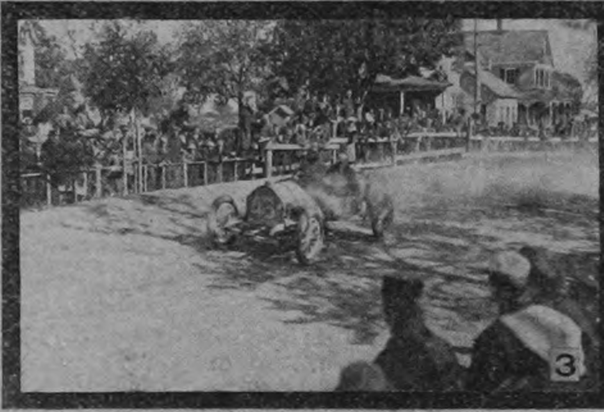
December 5-19—Reliability Trial for Light Cars, under direction of L'Auto, Paris.

January 28-February 5—Automobile Exhibition at Waverley Market, Edinburgh, Scotland, under direction of Scottish Motor Trade Association.

June 2-8—Annual Prince Henry of Prussia Touring Competition, under direction of the German Imperial Automobile Club.

ALCO
WIN
VANDERBIL
CUP
1





The upper left hand cut, No. 1, shows the winning Alco, driven by Grant, passing the judges' stand. V
No. 2 shows Ray W. Harroun in a Marmon Car, winner of the Wheatley Hills Sweepstakes, rounding
Westbury turn on his last lap. No. 3 shows Matson in a Chalmers-Detroit "30," winner of the Massape
trophy, rounding the Hicksville turn.

The Vanderbilt Cup Race, which at one time was considered the chief event in the year's racing program, this year proved to be a very uninteresting affair, and it is doubtful as to whether the race will be repeated next year. That the race lacked its old-time glamour and picturesqueness was manifestly noticeable to anyone who witnessed some of the former contests.

In the first place the affair has dwindled into a contest for stock cars, which from the dealers' standpoint is considered to be of more value than formerly, although it is doubtful as to whether the showing made by the majority of cars in this race will tend to promote any sales. Secondly the running of three separate classes of cars at one time spoiled things from the very beginning. The racers were sent away at 15 second intervals, with the result that the last of the big cars was hardly off before the first of the baby cars completed its first lap. Consequently for the first eight to ten laps of the race the cars passed the grand stand in bunches, and the crowded condition of the track proved most trying to the drivers. The frequent passing of the cars also played havoc in the timers' stand; the timing and scoring arrangement being the poorest
the timers and their assistants who c
not seem able to send out the scores co
rectly.

The course was about half as short
in previous years and much speed w
lost while making the turns which more
less resembled freshly plowed fields
short time after the race started. Tak
as a whole the drivers were moved wi
the spirit to run a safe race, for all we
more or less afraid of the course, partic
larly the Parkway section, with its terri
pounding on hard blown tires.

That no accidents happened to spec
tors is due mainly to good luck. While
is true that the Parkway was well polic
and kept clear, still what would have ha
pened to some of the spectators alo
the Hicksville county road, had one
the cars shed a wheel, or broken its ste
ing gear can only be left to imaginatio
The crowd was constantly walking on t
course, crossing back and forth and som
times scarcely got out of way in tir
for the cars to pass through.

The Massapequa trophy was captured
Joe Matson, driving a Chalmers-Detroit
The distance was 10 laps, or 126.40 mi
and was covered in the time of 3 hou
10 minutes and 21 1-5 seconds. The ave

sort of walk-away for Harroun, as he took the lead beginning with the first lap and held it through to the finish, he being the only one to complete the fifteen laps. The small cars made a better showing than did their higher powered brothers, for in the Wheatley race four out of the six starters fought it out to the finish.

Harry Grant, the winner of the Vanderbilt cup, driving a 60 H. P. Alco car, covered the distance of 278.08 miles in four hours, twenty-five minutes and forty-two seconds. Grant's final lap was his best, it being at an average of 71.9 miles an hour, while his average speed for the entire race was at the rate of 62.77 miles per hour. Louis Chevrolet made his best speed in his fourth lap, doing it at the rate of 76 miles an hour, but this burst of speed resulted in the blowing out of a cylinder head, and his withdrawal from the race.

Strang with his Fiat quit in the second lap on account of a broken radiator while Mitchell's Simplex suffered a broken connecting rod in the third lap. During the fifth lap three cars were out of the race, Chevrolet and his Buick, Aitken, with the National, and Hearne, driving the Fiat. The National cast a wheel while the Fiat broke its crank case. Seymour's Isotta broke its front axle during the sixth lap and in the seventh lap the Marmon went out with a cracked cylinder. The eighth lap saw no change in the position of the first four contestants. In the ninth lap Grant, with his Alco, jumped into fifth place, due to his steady driving. In the tenth lap the first six cars were still running in their same relative positions.

During the eleventh lap the Apperson, driven by Harding, broke a steering knuckle. While on the 13th lap, Lorimer's Chalmers-Detroit broke a cylinder, while Merz also withdrew his National on account of a broken cylinder, leaving still five contestants on the course. From the fourteenth to the nineteenth lap, inclusive, Knipper's Chalmers-Detroit held the lead, followed by the Alco and Fiat. In the twentieth lap Knipper had lubrication troubles which resulted in a stop that made it impossible for him to get under way again in time to finish the race. The Alco then advanced into first position and maintained the lead until the finish. The Fiat, driven by Parker, came in second with the time of 4.30.58 3-10. The official scorers failed to record the Alco's eleventh lap as he crossed the tape robbing the Alco of its well deserved victory. The prompt action, however, of Arthur Jervis, the American Locomotive Company's representative, showed that the official score was in error. By calling up the checkers at the various telephone stations the matter was soon straightened out and starter Wagner had barely time to flag the Alco on its last lap.

PREPARATIONS FOR MADISON SQUARE GARDEN SHOW

In seeking to produce a proper setting for the motor cars, motorcycles and accessories, to be shown at the Tenth National Automobile Show at Madison Square Garden, N. Y., January 8-15, the show managers will not spare expense; this is made very clear by the fact that more than $30,000 are to be expended for the decorations. The annual automobile show in the Garden is becoming every year more important as a social event at which the latest fashions, in both cars and costumes, are displayed, and for several years now it has been the yearly affair for which the Garden is most handsomely decorated. White and gold are the colors that have been selected to predominate in the decorative scheme next January, although crimson and green also will be strongly in evidence.

The forthcoming show will be practically void of plaster and staff works, this rather tawdry class of ornamentation and an effect of solidity and massiveness will be produced, together with a feeling of distance, breadth and general roominess. A Roman seat, or fountain, which is not of a height to assert itself offensively, and permits a comprehensive view of the Garden, will be constructed opposite the entrance-way to aid in the artful plan of "opening up" the interior.

COL. CLIFTON RE-ELECTED PRESIDENT OF LICENSED ASSOCIATION

At the annual meeting of the Association of Licensed Automobile Manufacturers, held at their offices, 7 East Forty-second street, New York, the following officers and Executive Committee were elected: President, Charles Clifton; vice-president, S. T. Davis, Jr.; secretary, L. H. Kittredge; treasurer, Col. George Pope.

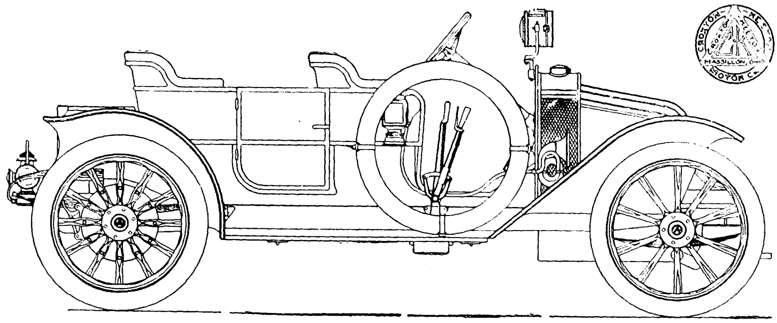
Executive Committee: Chas. Clifton, S. T. Davis, Jr., Thos. Henderson, Hugh Chalmers, Herbert Lloyd.

Have you looked into the features of 'The Buyer's Descriptive Index?" If not, look up pages 200, A, B, C and D, this issue.

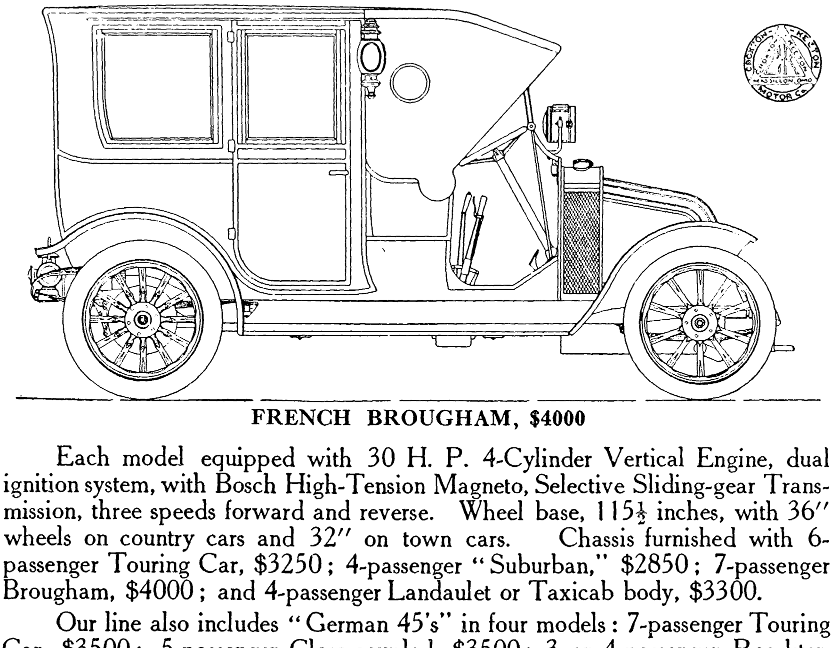
B. H. Pratt, office assistant to H. T. Dunn, president of the Fisk Rubber Co., has been named as Pacific Coast manager of the Fisk Company, with headquarters in San Francisco.

Croxton-Keeton Cars

FRENCH TYPE



FRENCH SUBURBAN, $2850



FRENCH BROUGHAM, $4000

Each model equipped with 30 H. P. 4-Cylinder Vertical Engine, dual ignition system, with Bosch High-Tension Magneto, Selective Sliding-gear Transmission, three speeds forward and reverse. Wheel base, 115½ inches, with 36″ wheels on country cars and 32″ on town cars. Chassis furnished with 6-passenger Touring Car, $3250; 4-passenger "Suburban," $2850; 7-passenger Brougham, $4000; and 4-passenger Landaulet or Taxicab body, $3300.

Our line also includes "German 45's" in four models: 7-passenger Touring Car, $3500; 5-passenger Close-coupled, $3500; 3 or 4-passenger Roadster, $3500; and 7-passenger Limousine, $4500.

Dealers would do well to **investigate** the **Croxton-Keeton** line before closing for 1910.

The Croxton-Keeton Motor Co.

MASSILLON, OHIO

NEW YORK
1662 Broadway

CLEVELAND
2174 E. Ninth St.

LOS ANGELES
842-6 Olive St.

TOLEDO
233 Ontario St.

CHICAGO
2035 Michigan Ave.

BOSTON
Motor Mart

KANSAS CITY
425 Delaware Ave.

PROVIDENCE
430 Broad St.

SALT LAKE CITY
225 S. W. Temple St.

PITTSBURG
5920 Baum St.

DENVER
323 McPhee Bldg.

SEATTLE
1319 Fifth Ave.

GENERAL INDEX

Additional Indexes will be found at the back of the book; a "Buyers' Classified Index" of the entire contents of the book, both reading and advertising pages, and an alphabetical index to the advertisements.

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In Whatever Type

Diamond

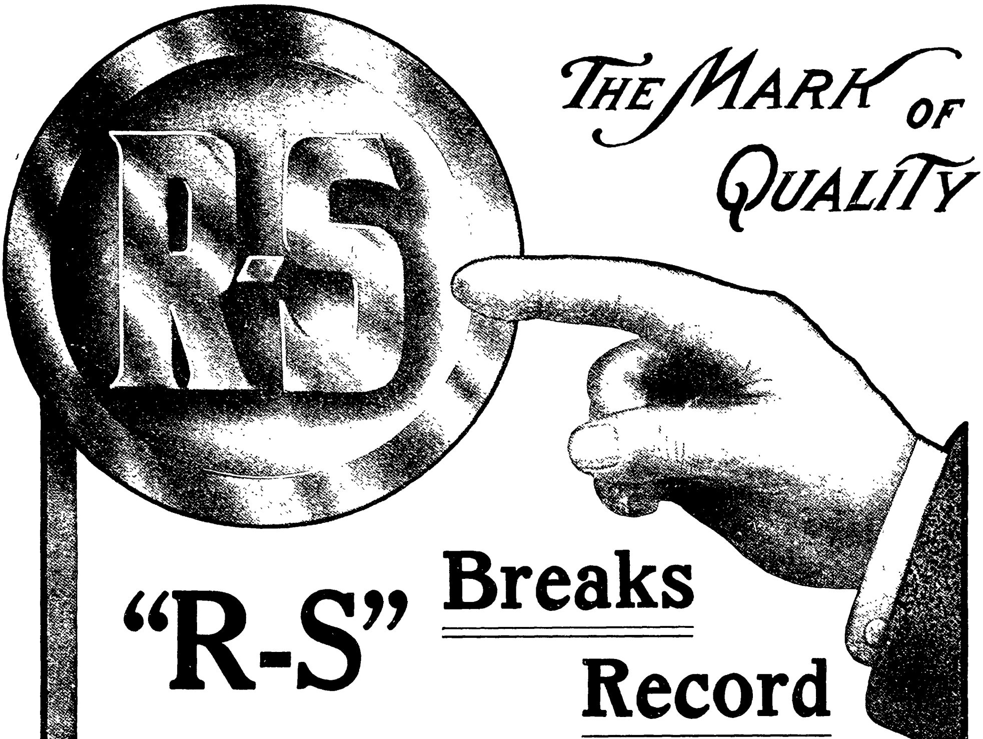
Tires Lead

Users Know

Diamond Demountable Rims

for Speed, Safety, Convenience, Comfort

THE DIAMOND RUBBER CO.
AKRON OHIO



"R-S" Breaks Record

"R-S" ESTABLISHES NEW TRACK RECORD

At Philadelphia, Pa., Point Breeze Track, October 30, 1909, making a mile in one minute flat on 6 h. p. "R-S" and then going it one better on a 7 h. p. "R-S" by making the

Mile in 59⅕ Seconds on a flat circular dirt track

breaking record which has stood for over two years, against a field of the most prominent makers of machines driven by some of the most expert riders in the country.

"R-S" Also Wins:

- **FIRST** in 5-Mile Philadelphia Championship Race, S. C.
- **FIRST** in 10-Mile Open, single cylinder.
- **SECOND** in 5-Mile Novice.
- **SECOND** in 10-Mile Open, twin cylinder.
- **SECOND** and **THIRD** in 25-Mile Open, twin cylinder.

AT WINFIELD, KANSAS, OCTOBER 15 and 16, "R-S" WINS FIRST IN ALL RACES

AT DAYTON, OHIO, OCTOBER 8 and 9, "R-S" wins second in all races, defeating all makes excepting one machine ridden by Amateur Champion of the World.

TRAILERS DO NOT RIDE "R-S" MACHINES

No Limit to Speed but the Law. *Built and Tested in the Mountains.*

READING STANDARD CO.

Department "C" - READING, PA.

CYCLE AND
AUTOMOBILE
TRADE JOURNAL

ENTERED AT THE PHILADELPHIA POST OFFICE
AS SECOND-CLASS MAIL MATTER

PUBLISHED MONTHLY BY THE
Chilton Printing Company
Market and 49th Sts., Philadelphia, Pa.

JAMES ARTMAN, President
GEO. H. BUZBY, Vice-President
C. A. MUSSELMAN, Sec. and Treas.

WESTERN REPRESENTATIVE
J. WALTER SCOTT

EASTERN REPRESENTATIVE
F. M. DAMPMAN
253 Broadway, New York

EDITORIAL STAFF
JAMES ARTMAN, Editor-in-Chief
E. S. FOLJAMBE, Managing Editor
HUGH DOLNAR, Special Representative
CHAS. E. DURYEA, Mechanical Editors

Yearly Subscription	$2.00
Foreign Subscription	3.00
Single Copies	20 cts.

Change of advertising copy must reach this office not later than the 10th of each month. New advertisements will be accepted as late as the 20th.

Philadelphia, December 1st, 1909

CORRECT CIRCULATION STATEMENTS SHOULD BE COMPULSORY

From time to time in these columns have appeared editorials on the subject of the gross misuse which many publishers are making of circulation figures. Instead of growing better the situation seems to be growing worse, and it is time that something should be done to protect the advertising public against the unscrupulous publisher who uses false circulation statements to decoy the unwary advertiser into spending large sums of money with him.

The rates of advertising are largely based on the circulation, this being the case an advertiser is expected, and is willing to pay, higher rates to such publications as enjoy a large actual circulation. This is as it should be and is following in this particular line of business the same policies as are used in other commercial enterprises. If, however, a publisher states that his circulation is a certain amount, has not the advertiser a right to know the facts in the case? Why should he be expected, any more than any one else, to pay a certain price based on simply the mere statement of a publisher or his representative? Yet, this really represents the state of affairs and very few advertisers, even though they may desire it, are given proof of the actual state of the circulation. Is this not obtaining money under false pretenses? Why should it not be dealt with by law the same as is done with other cases which are classed under this head.

For years advertisers have apparently been content to pay the rates asked of them, these rates being based on mere statements of circulation, without proof. In fact, the majority of publishers, who are accustomed to misrepresenting circulation statements, flatly refuse to give any proof as to the extent of their circulation, and even refuse to allow any investigations to be made by committees representing their advertisers. This is manifestly an injustice and one that should, and will, be corrected. Although the postal authorities are evidently in possession of the facts in such cases, owing to their records of the copies of the publications mailed, these records are not common property and open to the inspection of those most vitally interested. Why these conditions are allowed to exist it is difficult to understand, but it is evident that the time is coming, and that in the near future, when those directly affected will no longer allow themselves to be hoodwinked and will demand proof of all circulation statements before placing large contracts for advertising.

In some states the matter has already been taken up and the making of a false circulation statement has been stamped as a misdemeanor. New Hampshire being the first State in the Union to remedy this flagrant evil. Many of the other states are apparently relying on the criminal code, which in reality prohibits such misstatements; we refer to the section relating to the obtaining of money under false pretenses. In addition to this there is, of course, the civil remedy, which renders void any contract entered into where there is false representation as to a material fact. Is not the circulation, upon which the advertising rates are based, a slight change in which may mean thousands of dollars to innumerable advertisers, is not this a material fact? Why should this form of misrepresentation be allowed to go unpunished while many petty cases, which affect comparatively few, are strenuously dealt with.

We believe that the time has come when not only advertisers, but also all honest publishers should unite to protect their rights and do away with such open violations of our laws. We believe that there should be a federal law to govern this matter, a law which would apply to all publications and particularly those having an interstate circulation. Toward this end we are working and trust that we shall have the support of the entire field of advertisers, and honest publishers. We desire expressions of opinion on this subject from those most deeply concerned, and shall be glad to publish ideas as to the best methods of correcting this evil as expressed in letters from the trade, individuals, business men's clubs, and trade and business associations.

SHORTAGE ON PARTS LIMITS CAR PRODUCTION

The marvelous development of the automobile industry is nowhere better exemplified than by a study of the progress made in the city of Detroit, which is acknowledged to be "The Automobile City." In this issue we are endeavoring to present to the public Detroit and the remarkable growth of the industries in that city. Not that this is the only city which has shown such an unexpected advance, but because within its confines are produced more well-known cars than in any other city of our country. Not only does it stand pre-eminent in the manufacture of completed cars, but is to-day, without exception, the largest producer of parts and accessories.

The industry in this part of the country was never in apparently better condition financially, and the growth is a substantial one. Much to the surprise of even those intimately associated with the manufacture and sale of automobile parts and accessories, the recent financial crisis had but slight effect on the automobile industry, as compared to its effect upon many other lines of endeavor. Statistics show that during this financial stringency the sale of automobiles decreased but little, and being on practically a cash basis, the money deposited in the banks was one of the sustaining factors which enabled the city to successfully pass the critical point.

From what might be termed a large and prosperous town, the automobile, more than any other one cause, has transformed Detroit into a bustling city. Factories are springing up with great rapidity to manufacture all kinds of motors, accessories and parts, in fact, the demand is so great for these constituents of the motor car, that the makers are absolutely unable to produce for 1910 the number of cars for which their agents desire to contract. This appears, at first sight, to be somewhat of a hardship when automobile makers are unable to get the parts, although they stand ready to pay in advance for them; but in reality this condition will undoubtedly render a valuable service to the industry. As is usually the case with any new, or comparatively new, industry, as soon as business is brisk, orders coming faster than they can be supplied and people paying premiums in order to receive early shipments, the makers are apt to become so enthusiastic that expansions are made with a very small basis of actual capital; factories are extended to an enormous size, and many chances are taken which would not be indulged in, or even seriously considered under more conservative business conditions.

The parts makers are making every effort to keep up to the demand, but seem to be unable to produce sufficient material, and numerous allied interests are taking up the manufacture of these commodities as it is rightly assumed that, for the present at least, there is considerable to be made by this work.

It is generally conceded that the entire output for the year will be much less, owing to the lack of suitable parts and accessories, than manufacturers of complete cars had intended; and this is just the point which we feel is working for the final good of the industry, as it surely and effectively puts a damper on overproduction. It is much better to close out the last of 1910 models with the public still desiring to purchase cars, which they are unable to get, than for even a few manufacturers to find themselves with several machines of a certain model, which will have to be sold at a sacrifice or remodeled for the ensuing season. These facts are appreciated by most of the manufacturers, and we hope that the present prosperous condition of the industry will not cause a mushroom growth for which there will be cause for regret in the near future.

We wish to give a word of warning to the new manufacturers to operate conservatively, and profit by the experience of some of the older firms who, although they have increased their output steadily year by year, have not allowed their enthusiasm to carry them beyond their means. Only by healthy growth, governed by conservative methods, can it be hoped to produce a substantial increase. That there is room for much greater growth is not questioned, as we expect to see in a few years an output of automobiles which will total as large as that of the carriage makes, and in all probability with the final advent of the $400 to $700 machine the total number of automobiles manufactured each year will exceed in numbers the output of the carriage manufacturers.

FEDERAL CONTROL OF TOURING LICENSES.

The absolute necessity of Federal control in the matter of licensing automobiles for touring, is forcibly brought to the attention of any motorist who attempts to make even a small tour which will take him into several states. The varying methods employed by the different states for taxing automobiles also illustrates the necessity for some kind of uniform regulation.

When a car passes from one state to another it becomes necessary under the present conditions to remove all tags and substitute others or display particular licenses required in that special section, so that the motorist must carry an elaborate assortment of tags, licenses, seals and certificates, etc., so that he can conceal, change and show them at the proper times. The procuring of these licenses requires several weeks' time before it is safe to start or one may find himself held up or even arrested, and in some states even with the license from the home state displayed, it is necessary to supply proof that one is actually a resident of that state. As the license regulations are being moderated in certain sections, while in others they are being made more stringent, a greater diversity than ever exists at the present time. The wonder is that the family motor car on its tour is not held up more often than it is for not complying with the peculiar and almost innumerable requirements, necessitated by the various state regulations. Even the variation in regulations in different parts of a single state are sometimes quite noticeable, and cause considerable inconvenience.

The matter of horse power has now entered into the methods of taxing automobiles, on the basis that a high powered machine does more damage to a road than a low powered one, all of which is undoubtedly true. The horse power method of taxing is therefore an acceptable one, provided the revenue thus obtained is actually used for the maintenance and improvement of the roads, and that the tax is actually based on the horse power of the various machines and not simply the maker's statement of horse power. Such regulations when loosely based on the rated horse power, put a premium on low or false rating machines. Taxing by horse power can be done with considerable assurance of justice to all if piston displacement or the actual bore and stroke of the engines are taken into consideration as the basis for the tax and not simply the horse power which a salesman or a manufacturer may see fit to state as the engine's rating. The justice of these remarks will be seen when it is understood that certain machines known as 30's actually develop in the neighborhood of 45 horse power, while others rated as 50's probably do not develop over 40 horse power. If the piston displacement is made the basis for the horse power rating there will be among touring cars some semblance of uniformity in the amount of tax to be paid.

Whatever is done, in the matter, however, should be of a sweeping and general nature so that somewhere near the same regulations, restrictions, etc., will exist throughout the country, and this cannot be as long as each individual state or section is allowed to impose as many peculiar or unusual restrictions as some of its legislators may see fit. As long as these conditions are allowed to exist the variations will be almost beyond the ability of the average tourist to comply with, and we urge all motor clubs in all parts of the country to agitate at all times and with the utmost energy of which they are capable, the Federal control of at least the licenses for touring. Such action on the part of the clubs throughout the country and in co-operation with the American Automobile Association will eventually bring about the desired result.

THE NEW FEATURE OF THE FORTHCOMING JANUARY NUMBER

In the next issue of the Cycle and Automobile Trade Journal we will inaugurate an entirely new annual feature, which will hereafter be a part of the January number each year, and will be greatly appreciated by our readers whether they be manufacturers, jobbers, dealers, repairmen, or simply owners of cars.

The new feature will be a classified tabulation of all the products of each of the advertisers in that issue, giving the essential points of merit of each article and wherever possible stating the list-price as well, and will be known as "The Buyer's Descriptive Index."

The January number of the Cycle and Automobile Trade Journal has for years been regarded as the year book of the trade, and it has always carried a very much larger amount of advertising than any other issue, and this added feature will be an improvement on its old features that will increase its value both to readers and advertisers a hundred fold.

Our purpose is to give our readers a conveniently arranged reference for use in making the necessary comparisons for buying. that is, to give them information in compact form which is not available elsewhere, except in the catalogs and price lists of the various concerns, and which would entail a very large amount of correspondence, for each buyer to accumulate, and then a great deal of time to search out the points and prices needed for comparison. The "Buyer's Descriptive Index" will obviate all of this onerous detail work, and enable a buyer, whether he be a large buyer or a small one, to ascertain in a few minutes the points regarding any article that would otherwise consume probably a week or more in correspondence.

In limiting the "Buyer's Descriptive Index" to those concerns which are advertisers in our January number we are making it more valuable, for the reason that all of the more prominent and representative concerns are regular advertisers in the Cycle and Automobile Trade Journal, and therefore the information contained in the index will be free from dead or worthless matter, as it will be practically confined to the live active concerns in the trade. This is a feature which adds to the time saving qualities of the "Buyer's Descriptive Index" as much time is wasted ordinarily looking up concerns who are but slightly connected with the trade or who only manufacture in a small way.

Another point we make in this way is that the advertisements will give additional information to that contained in the "Buyer's Descriptive Index" and therefore make it the more complete and comprehensive, for the descriptive features of the "Index" must necessarily be very much condensed and without illustrations, so that it will not become too bulky and lose its compact and convenient form.

SOME TENDENCIES

Although the Atlanta Show came early many of the tendencies for the coming season were indicated. The most pronounced feature being the large number of low priced machines that were exhibited and the value which is now being given, as compared with cars of similar price as shown at previous shows. There is a strong leaning towards large runabouts among the makers of high priced cars, these runabouts usually carrying at the rear a tool box or single rumble seat. A very noticeable feature is the placing of the gasoline tanks on many of the machines at the rear of the front seats, this being the location of the tank in several models, which also had rumble seats. In these cases the tanks were usually of flattened or elliptical section so as not to extend too far toward the rear seats. Gravity feed is obtained by this location of the tank doing away with the complications of a pressure feed system. At the same time valuable carrying space, under the front seats is made available. This is probably a development due to racing car practice.

Some of the bodies shown were of new type, leaning strongly toward torpedo lines, in which unusually high doors are used at the sides of the front seat. Magneto equipment is all but universal, extending down even to the lowest priced models. There seems to be a tendency toward a magneto equipment alone without the use of auxiliary systems for starting. Semi-elliptic springs are more and more giving place to full elliptic springs, many of which are fitted with scroll ends. Three-quarter elliptic springs with scroll ends are very popular for a rear mounting and are evidently taking the place of semi-elliptic springs, which would otherwise have been changed to the platform type. On the very small, light weight and low priced cars there seems to be a leaning toward a single, wide, semi-elliptic spring placed crosswise at the rear of the frame. Pressed steel is more largely used for step hangers, pedals, brake drums, etc., than in previous seasons, and lighter forms of stamped steel running boards are displacing the wooden running boards. Aluminum for floor boards is very popular and is shown in several forms of pyramid surface, due to stamping rather than to casting.

Among the electric machines were noticeable many elaborately finished and equipped models, with enclosed bodies with inside steering. The Waverly cars have adopted full elliptic springs of large size, both front and rear. The rear springs are forty inches in length and the front thirty-six. The motors are completely mounted on springs rather than on the rear axle, yet all running parts are entirely enclosed. The body shows much study in an attempt to give as unobstructed a view as possible to the occupants; measurements disclose the fact that the front glass is much wider, deeper and higher than in previous models, and that at the sides the upright wooden portions are considerably narrower than previously, so that the view from the interior is very broad and sweeping. It is claimed by the makers that although the motors are not of new type, those used on the 1910 models are five per cent. more efficient than those of previous years. A new type of coach body is now used and mounted on a patented curve sill, which brings the step, floor and seat several inches nearer the ground than in the ordinary coupe.

GENERAL MOTORS PURCHASES CARTERCAR CO.

On November 1st, the General Motors Company purchased the stock of the Cartercar Company of Pontiac, Mich., which it had secured options on about sixty days previously.

The latest acquisition was incorporated in 1905, as a Michigan corporation with $150,000 capital. Since then, it has increased until now it has a stock of $350,000 and a plant having a floor space of 200,000 square feet. The taking over, by the General Motors Company, of the Cartercar stock does not mean any change of policy, but predicts the continuation of business on a greatly increased scale.

AN OPPORTUNITY

We wish to secure copies of "The Automobile Trade Directory" of the years 1903 and 1904. These are probably of very little value to any of our readers now, but as we wish to use them for a particular purpose, we are willing to pay a good price for one copy of each number published in the above years. Chilton Printing Co., Market and 49th Streets, Philadelphia.

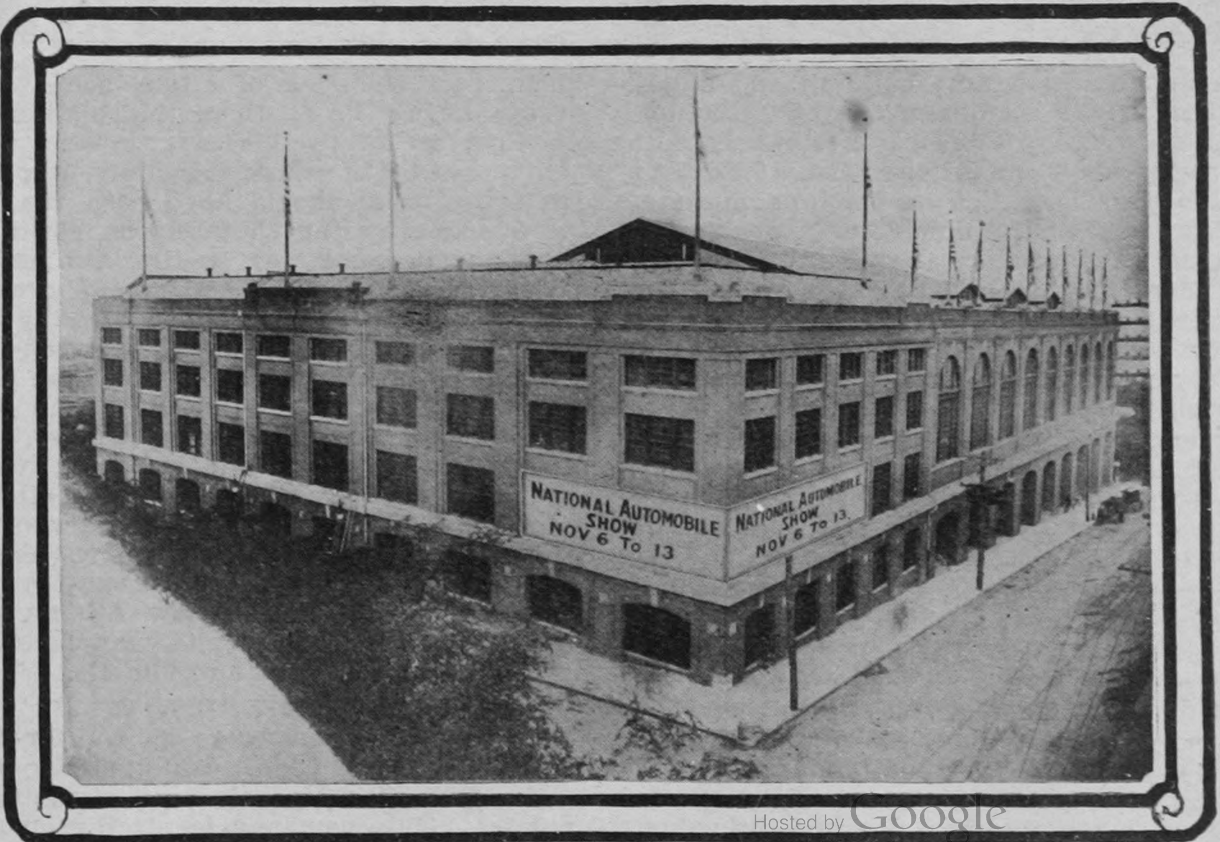
ATLANTA
KS
OLDSMOBILE
PREMIER
PREMIER MOTOR MANUFACTURING COMPANY
SHOW

For an entire week the city of Atlanta, a., gave itself up to the reign of the utomobile. Great interest was shown by he enormous crowds which taxed the acommodation of the city to its limits, every vailable sleeping place being eagerly enaged at all kinds of prices.

Parades, races and the First National outhern Show in the Auditorium made a usy week. Stores and residences were ecorated and the influx of touring parties from all directions, to say nothing of the contestants in the endurance run from New York to Atlanta, crowded the streets with motor cars, all carrying flags or emblems and presenting a gala appearance.

The city was literally turned over to the visiting autoists and the greatest leniency was shown by the authorities and police.

Live enterprising automobile manufacturers swung a large touring car upon


NATIONAL AUTOMOBILE SHOW NOV 6 TO 13
NATIONAL AUTOMOBILE SHOW NOV 6 TO 13

NORDYKE & MARMON
PACKARD MOTOR CAR COMPANY
PACKARD

a derrick on a new building and a large sign on the bottom of the car, illuminated by a group of electric lights, bore the inscription, "The Mitchell Car At the Top."

During the entire week automobile races were held at the new Atlanta Speed Way, many of the foremost racing drivers competing for the liberal cash prizes and valuable trophies. The track. which is wo miles in circumference, proved to be very fast and several world's records were broken.

THE ATLANTA AUTOMOBILE SHOW

The Automobile Show, recently held at Atlanta, Ga., was termed a "National Exhibit," and although there were several nakers from the middle west the size and cope of the show was not as great as ome other shows which are not heralded s national ones. The holding of a national show in the South was more or less f an experiment, serving to introduce, on permanent footing, the automobile into his territory. The attendance at the how was not as great as was expected y the manufacturers, nor was the volume f business as large as they had anticipated. blame for the lack of attendance at the show during the daytime. Much dissatisfaction, owing to this arrangement, was expressed by the show exhibitors, who felt that the races should have been run before and after the show, or on alternate days, or in some way so that two would not form counter attractions. However, the attendance at the show steadily increased toward the close of the week and was much better in the evening than during the day.

The show was held in the Armory, this being the only available building having sufficient floor space. The entire building was crowded to the utmost and the overflow was represented by several tent shows along the approach to the Armory, in one of which was shown a new Atlanta car called the White Star, and manufactured by the White Star Automobile Co.

SOME OF THE NEW CARS

Several new cars were shown for the first time, the Ohio, exhibited by the Ohio Motor Car Co., being one of the very newest. This company is placing on the market a line of six models based on a

FRANKLIN MANUFACTURING COMPANY
STEVENS

will be described in detail in an early issue of the Journal. The prices range from $1,750 to $1,850. The Mora Motor Car Co. exhibited a new runabout of four-cylinder type, modeled somewhat after the lines of the Renault, the radiator being just in front of the dash.

THE METZ

The Metz Company, of Waltham, Mass., exhibited for the first time the little Metz plan car, which is a complete and serviceable automobile at the phenomenal price of $378 knocked down, ready for assembling or $457 complete. This little car has a two-cylinder opposed, ball bearing, air cooled motor, placed crosswise under the hood at the front, and the drive is through a friction of the plate and traversing wheel type and side chains to each of the rear wheels. The running boards and guards are of racytype; the seats of metal and all cars are ironed for tops. At the rear is a large steel tool box, which can be removed if desired, giving a carrying space or can be replaced by a rumble seat. The machine contains high grade materials, is hubs. The car complete weighs less tha 600 lbs., and is capable, as shown by recen endurance contests, of maintaining a average speed of 20 miles an hour ove all kinds of roads, which means that must be capable of doing almost doub this under favorable conditions

The Black Crow line of cars were show for the first time by the Black Manufactu ing Company, Chicago. These little ca have a 4-cylinder, 25-30 H. P. motor, ha ing 3⅞ bore x 4½ stroke, while the large engine rated as 35-40 H. P., is 4¼x4 Six different models are based on tw chassis; the prices ranging from $1,0 to $1,750, the cars being three, four a seven passenger. These cars will be d scribed in detail in an early issue of th Journal.

One of the interesting features of th Stevens-Duryea Company's exhibit was th rear axle which was mounted on a sta and had the top half of the differenti case removed. The differential rotates a special type of cone and cup ball bea

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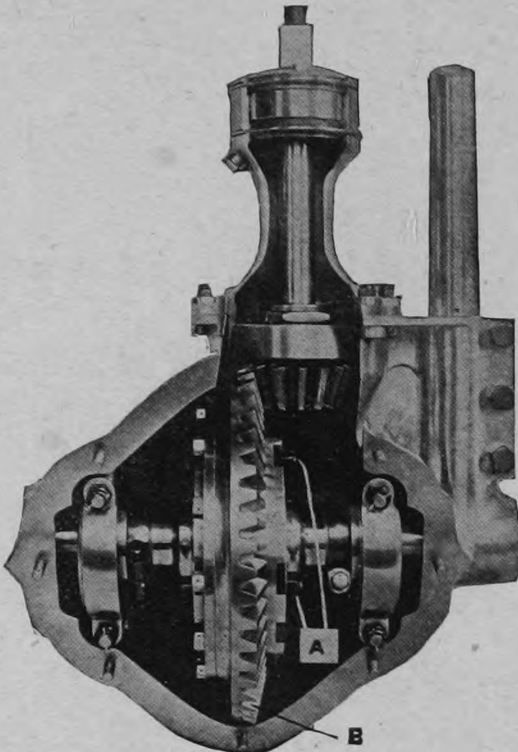
The pinion shaft has a squared end



View of rear axle and differential used in Stevens-Duryea Cars.

to which is fitted a universal joint. The pinion shaft rotates in imported annular type ball bearings. The differential housing is without vertical division, thus making it absolutely oil tight. No keys are used in this axle, all points of connection being by means of square dove tailing.

THE NEW BRUSH

In the booth of the Brush Runabout Company was shown the new models of the little single cylinder Brush Runabout, one of which is being placed on the market for 1910 for $485. This little car has a single cylinder balanced motor, of four cycle type, four-inch bore and five inch

and is fitted with webbed, racy typ guards, double bucket seats, raking steering column and an elliptical tank place at the rear of the seats. These littl cars can also be had with an enclosed o limousine body.

THE OHIO CARS

A new line of cars, known as the Ohio were shown for the first time by the Ohi Motor Car Co., Cincinnati, O.

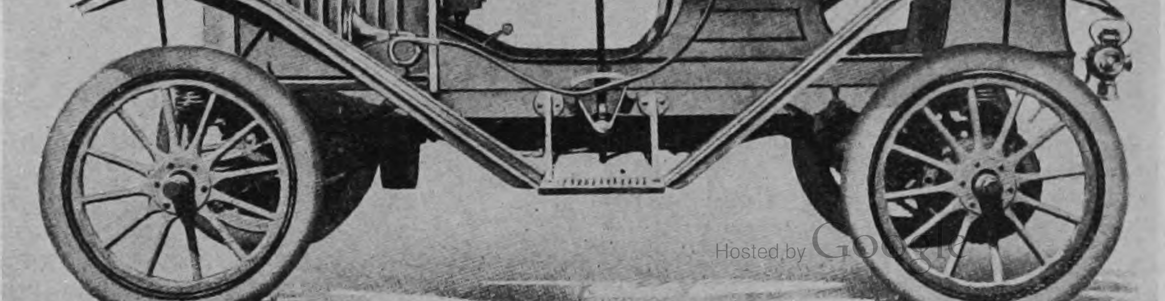
The line consists of six models, base on one standard chassis, namely, a 5 passenger touring car, 40 A; a close coupled detachable tonneau, 40 B; 4-pass senger suburban, 40 C; a roadster wit double artillery seats, 40 D; a roadste with single rumble seat, 40 F, and a roadster, 40 G.. The prices range from $1,75 to $1,850, the first three being $1,750, an the last three mentioned, $1,850.

These prices include a most complet line of accessories such as top, windshield speedometer, toe rail, robe rail, magnet gas lamps, oil lamps, generator, horn an tools.

The motor, 4-cylinder, 4¼x4¾, is rate as 35-40 H. P. The change gears are thre speeds selective and drive is by shaft t bevel gears. These cars will be describe in detail in an early issue.

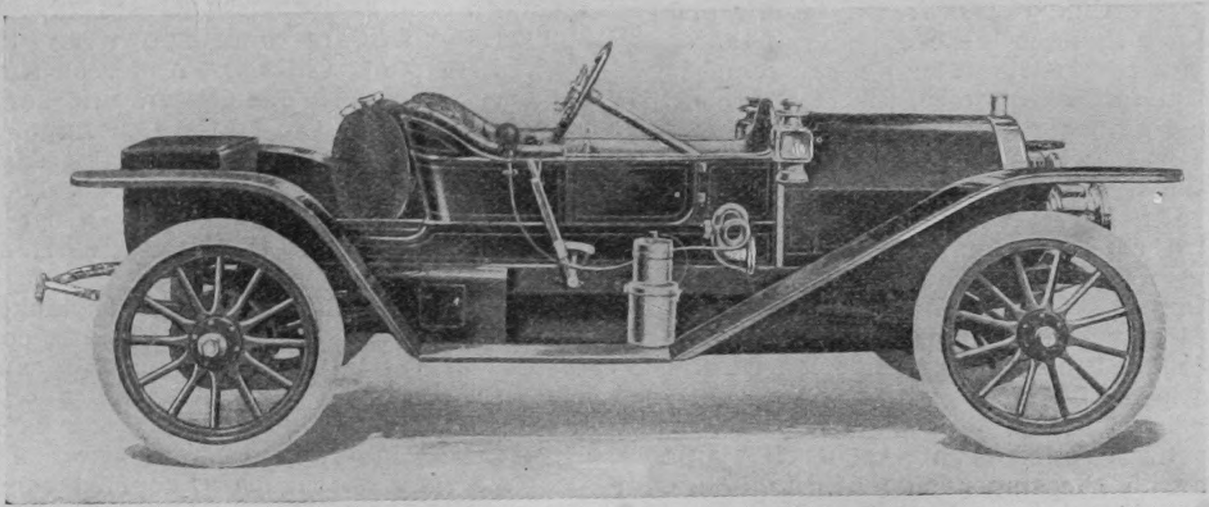
NEW McINTYRE LINE

The W. H. McIntyre Co., of Auburn Ind., exhibited for the first time thei line of automobiles with pneumatic tires none of the high wheel types being show except a commercial car on the street The new line consists of six models i addition to their complete line of commercial cars. These six are based on a 3 and a 40 H. P. chassis, with 4-cylinde water cooled engines. The models on the smaller chassis are M-2, a 2-passenge



an M-10, 2-passenger runabout, M-15 and -20, the bodies being the same as those ove and the prices being $1,750 each.

for $2,000, and a $2,500 touring car with larger body, also a Landaulet and Limousine for $3,600, and $3,800, respectively.



The new Speedwell, with torpedo body, shown for the first time at the Atlanta Show.

FEATURE OF CADILLAC EXHIBIT

A feature of the Cadillac exhibit was a ble of parts on which were shown many the plug, ring and limit gauges used in e construction of the cars, and which ade possible the winning of the Dewar rophy. Cylinder heads, pistons, cylinder nd other parts were also shown to ilstrate accuracy of workmanship and inrchangeability of part. An illuminated ectional engine was also shown.

LARGE WHEELED OLDS

On the new models of the Oldsmobile as shown a new carburetor of float feed pe, fitted with an adjustment of the eedle valve by means of a small accesble handle and a set of spur gears. This rburetor also has a nozzle for drawing f gasoline for other purposes such as eaning, etc. a convenient arrangement as any tourists will recognize. These moels were shown with 42-inch wheels, now distinctive Olds feature.

NEW MORA RUNABOUT

The Mora Motor Company's new 4-cylder runabout at $1,050, is modeled somehat on French lines. The change speed ears give two speeds forward and a reerse. The motor is 4-cylinder, 3¼x3½, nd 32-inch wheels are used. The seating pacity is two. This little car is known the Mora "20" and will be described an early issue of the Journal.

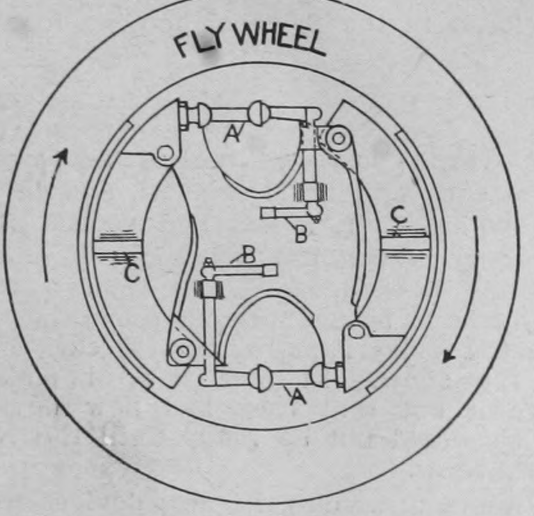
WHITE CO.'S GASOLINE CAR

The White Company, Cleveland, O., exbited in addition, to their steam models, everal of the new gasoline cars which ere here shown for the first time. These

The motor is of French type, cast "enbloc" A. L. A. M., rating 28 H. P. the bore is 3¾ and stroke 5⅛, this being the longest stroke in proportion to bore yet met in this country by the writer. The change gears are of the 4-speed type direct on third and geared up on high.

NEW DEVICES ON RAMBLER

Some new features were shown by the Jeffery Co., in the 1910 Ramblers. The most important was the clutch of internal expanding shoe type as shown. The shoes are of aluminum faced with leather and act against the inside of the fly wheel. Toggle joints A. A. are operated by arms B. B. from the sliding collar, and the toggles expand the shoes against the fly wheel. Centrifugal force aids the grip of this clutch and under the leather is ar



The new Rambler toggle joint expanded clutch.

The hoods are now held by a new spring fastener very quick in action. A new kick switch is placed on the dash so that magneto and storage battery ignition can be used each independently, yet but a single set of plugs are required. The floor of the tonneau has been lowered and a new adjustable foot rest fitted. The tonneau floor overhangs the frame giving plenty of knee room to the occupants of the ends of the rear seat. The lamps are of new and distinctive pattern, the Rambler spare wheel entering into the design. A new and universal wind shield is also a feature, all models being fitted with arrangements for attaching the shields. A hinged floor board of cast aluminum gives access to wing nuts by which the brakes can be instantly adjusted. A small special pump is also conveniently placed so oil can be introduced into the transmission case. The rear end of the drag link connecting the steering knuckle is now held up into position by a coiled spring thus relieving the wear on the upper side of the ball end of the steering arm. A new latch to the door has been devised which can be opened by touching a short lever with the toe, etc., in fact. the entire car bristles with modern conveniences and refinements.

NEW COLE "30"

The new "Cole 30" car was shown by the Henderson Motor Sales Co., of Ind. This is a 4-cylinder motor of 30 H. P., 4x4 inches, with unit power plant on a 4 point suspension. Thermal water circulation is used and a plunger pump forces the oil taken from the base and drives it to the main bearings, overflow supplying a splash pool. The clutch is of cone type, enclosed in the flywheel housing forming a part of the change gear case housing. There are three speeds and reverse selectively operated drive is by shaft to a Weston Mott rear axle. The models comprise two, four, five and six passenger cars, also a Limousine if desired, the price being $1,500 for all models except the Limousine, this price including a Splitdorf magneto.

The F-A-L Cars were shown by the F-A-L. Co., of Chicago, Anderson-Kent Company, Southern distributors and Jackson-Cerf Motor Co., Atlanta, Augusta. There are four models all in the same chassis; a speed car, Toy Tonneau, Touring car, all at $1,650, and a Town car at $2,250. The motor is 4-cylinders, 30 H. P., 4¼x4½ inches.

The Petrel Motor Car Co., Milwaukee, Wis., exhibited a line of Petrel cars, consisting of three models using the same chassis, Roadster, Toy Tonneau and 5-passenger Touring car. The motor is 30 H. P., 4 cylinder, 4⅜x4¾ inches. The gasoline tank on the close coupled car is raised high and placed back of the rear seats, giving a gravity feed. The drive is by friction proper fibre driving wheel, traversing a composition disc. The method of applying pressure to the discs is novel, consisting of a coiled spring similar to a clutch spring which keeps a constant pressure between the friction surfaces for normal running, but by means of a pedal extra pressure can be obtained for very hard roads or hills. Therefore the friction surfaces are never subjected to great pressure except for short periods as needed. The emergency brake throws out the friction surfaces. Drive is by double side chains to the rear wheels. This drive, according to tests made at the Armour Institute, Chicago, showed 85 per cent. of the engine power to the wheel. The trans-

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Among the Accessories

A very complete line of accessories were shown in the basement, and in the mezzanine floor, annex and second floor Although a comprehensive display fewer entirely new devices were shown than might have been expected, this being accounted for perhaps by the very early date of the show. In fact, several makers gave it out that they had new devices which would not be ready until the New York show.

Prominent among the new devices were the Connecticut Master Vibrator Coil, of the United Manufacturers, Inc., the new Shipman Speed Indicator, of entirely new principle, marketed by the Shipman Instrument Co., Sunbury, Pa. A new removable rim, known as the Empire, by the Empire Tire Company, of Trenton, N. J.; The S. X. magneto, by the Lutz-Lockwood Mfg. Co., Aldene, N. J., and a new Jones Combination Model C pneumatic and electric horn was shown by the Jones Speedometer Co., of New York.

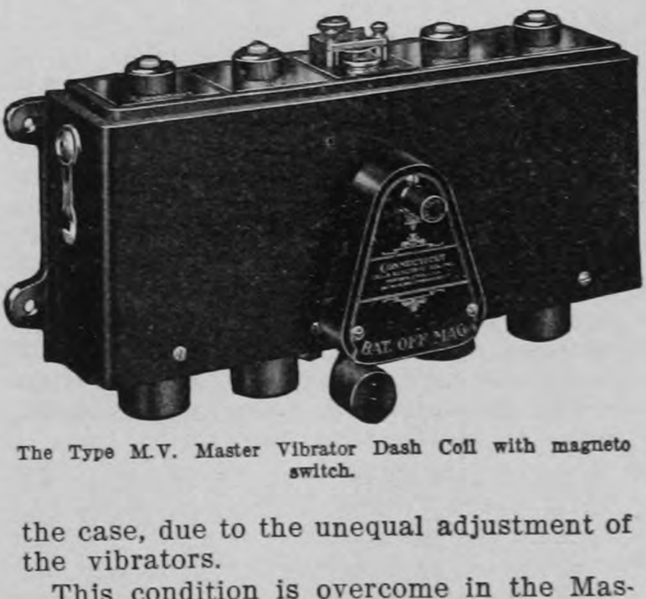
The Standard Auto Supply Co., of Chicago, exhibited for the first time a new tire gauge for indicating the pressure in the tires and a novel Trouble Finder or light, which attaches to the head, throwing the light conveniently into the machinery without effort on the part of the operator. An entirely new tire with anti-skid tread was exhibited for the first time by the Federal Rubber Co., of Milwaukee, Wis.

Republic Rubber Co., of Youngstown, Ohio, showed for exhibition purposes one of their Republic tires with little stems or spines of rubber of the tread sticking up so that visitors could stretch the spines and test for themselves the quality of the rubber of the tread, certainly a unique method and one which attracted considerable attention.

The two types of coils shown herewith are manufactured by the Connecticut Ignition Department of the United Manufacturers, Inc., 76th and Broadway, New York City. The type M V coil is built on what is known as the master vibrator principle, using but one vibrator which produces the electrical interruptions in the ruhmkoff windings.

With the ordinary type of spark coil, employing one vibrator for each coil it is necessary to adjust each vibrator independently and unless they are adjusted so as to draw the same amount of current and are identical in construction and insulation, the results obtained from the engine are anything but uniform, for the reason that a heavy current passing through a coil will give a later spark in the cylinder of the engine than a light current would under the same conditions.

Take for example a four cylinder engine operated from a four cylinder individual vibrator coil. Assume that the coil connected to No. 1 cylinder is adjusted to draw one-half ampere and the engine is firing exactly on dead center; No. 2 coil may be taking an ampere, with the result that No. 2 cylinder is firing possibly two or three degrees beyond center: No. 3 cylinder may be taking two or three amperes, with the result that it is firing possibly five or ten degrees beyond center; No. 4 cylinder may be taking one-quarter ampere, with the result that it is firing before the piston reaches center. Thus while you have an engine which to all outward appearances is firing regularly, at the same time, such is not the case, due to the unequal adjustment of the vibrators.

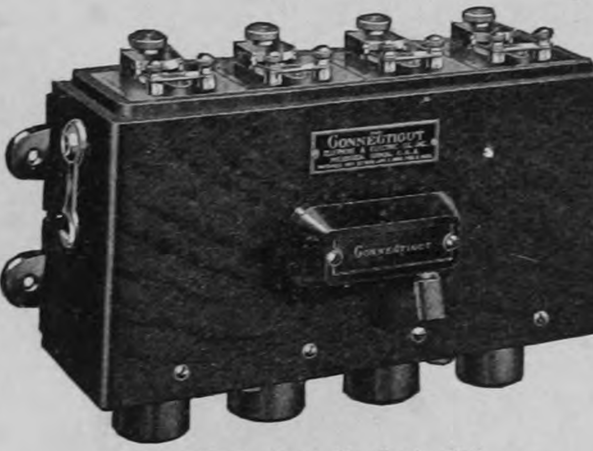


The Type M.V. Master Vibrator Dash Coil with magneto switch.

This condition is overcome in the Master Vibrator type of coil for the reason that when you adjust the vibrator to

in the majority of cases that it will be
noticed immediately upon opening the mu
fler cut-out.

It will be readily understood that ther
is but one vibrator to adjust and afte
this adjustment is made it will be un
necessary to touch the coil for a lon
time.



Four-cylinder Type X. Dash Coil.

On the top of each coil unit is locate
a cut-out button, the pressure of whic
will cut out any cylinder for testing pu
poses. In the individual vibrator typ
of coil the cylinders are tested by pres
ing down one or more vibrators, thus cu
ting off the spark. In the M V type th
result is accomplished by means of th
buttons above referred to. The maste
vibrator is so made that the contacts d
not revolve in making adjustments.

The coil is made on the unit coil pri
ciple and it is simply necessary to li
the unit from the case after removing th
cover, which makes it exceedingly co
venient in case of test where it is d
sired to reverse any of the units in th
case. Each coil unit is separated b
means of a buck-proof shield, which pr
vents the bucking effect due to leakage
current from one coil to another whe
the motor is pulling on a hill with
heavy charge of gas. This bucking effe
sometimes causes a cylinder which is
the firing position to fire and the next cy
inder which is compressing to fire als
with the result that in some cases the m
tor is stalled. These coils are manufa
tured under license of the Unit Coil Co
patents covering unit, buck-proof a
master vibrator construction.

The Vibrator Unit is made in t
styles, single and double. The accompan
ing illustration shows the double vib

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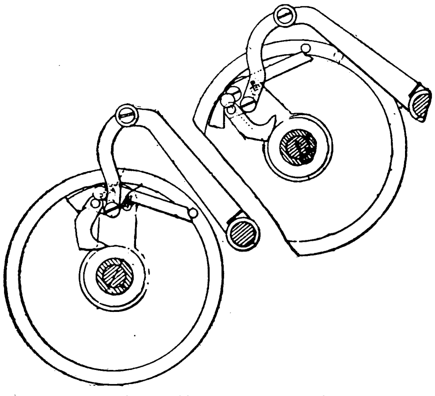
be fitted with either Plug, Lever, or Magneto Switch.

The prices of the single master vibrator type are $15, $30 and $60 for the 2, 4 and 6 cylinder coils, respectively, to which $3. is added for a double vibrator and $1 for a magneto switch.

The four cylinder Type X dash coil has been designed for the purpose of filling the requirements for a less expensive coil than their standard make, more particularly where coils are used as a secondary system, for starting or emergency purposes, depending upon a magneto for the primary ignition. It is made up in the very best possible manner, but is considerable smaller than their standard coil. It is built on the unit principle with removable units and is fitted with either type "L," type "P" or magneto switch as desired. The prices for the 1, 2, 3, 4 and 6 cylinder coils are $8, $16, $23, $30 and $45 respectively, with the extra charge of $1 for the magneto switch.

THE WILKINSON'S MOTOR STARTER

In the booth of the Lambert cars, manufactured by the Buckeye Manufacturing Co., Anderson, Ind., was exhibited on a Lambert car the latest in self-starters. This device is known as the Wilkinson Improved Motor Starter, and has been adopted as standard equipment for the 1910 Lamberts, thus making the car crankless. The device is adaptable to any gasoline car and is so arranged that it is impossible to get injured by a back kick. For this reason and on account of the leverage attained it is possible for a woman or child to start the car from the seat..



The device consists of a pedal connected by links to a bell crank arm, the end of which when the pedal is depressed engages studs projecting from the face of the fly wheel near its rim. As the pedal is depressed to its limit it throws the engine over, the action being so strong that without much effort any ordinary motor can be started over several compressions with one throw of the lever. This, of course, starts it and if not it can be operated again. The end of the arm that engages the fly wheel pins or in the case of the Lambert pinion the friction disk is curved sufficiently so that a sudden reversal of the fly wheel such as caused by a back kick, wedges the lever off the pin, so no movement of the foot lever is caused and no back kick felt by the foot. However, the lever does not slip off the pin when starting owing to the fact that the bell crank is so pivoted that the pressure tends to hold it on the pin, but this pressure, although sufficient to hold it against the pin for starting, is not enough to keep it there against a back kick. The starting mechanism is entirely independent of the rotating parts when running so gives no additional friction. Shop rights can be had on the device as applied to any standard make of car.

SAFETY TIRE AIR GAUGE

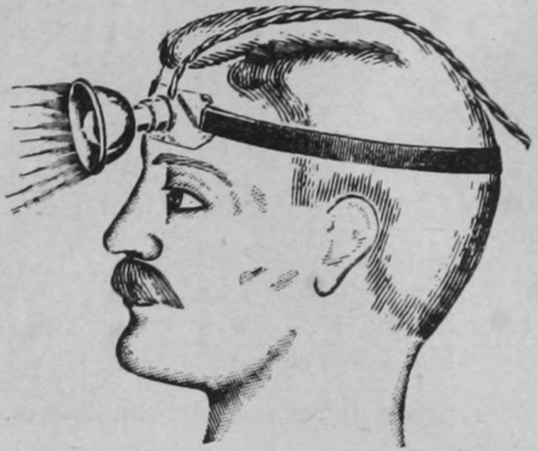
The Standard Automobile Supply Co., of Chicago, also showed the new tire air gauge. This little device, when placed on the valve stem shows by a notched indexed position the exact pressure in the tire. It can also be used in connection with a tire pump by attaching it to the valve stem and then attaching the pump connection to it. It then indicates the state of tire inflation. It is claimed to be very accurate and having few parts does not get out of order. The price of this gauge is $2.00.

THE 1910 FEDERAL TIRE

This new tire has just been placed on the market by the Federal Rubber Co., of Milwaukee, Wis., and was first exhibited at the Atlanta Show. The feature of distinction is the patented Maltese Cross anti-skid tread. This tread consists of raised crosses ⅝ of an inch in width and arranged in three rows. The tires have a very heavy tread and are claimed to give exceptional wearing qualities. They are high grade throughout, both in material and workmanship. They are made in all standard sizes and fit all the regular rims. The inner tubes are made with a special moulded joint for which much is claimed, there being no lap or thick place at the joint nor any stiffness at this place. Prices on application.

THE RELIABLE TROUBLE HUNTER

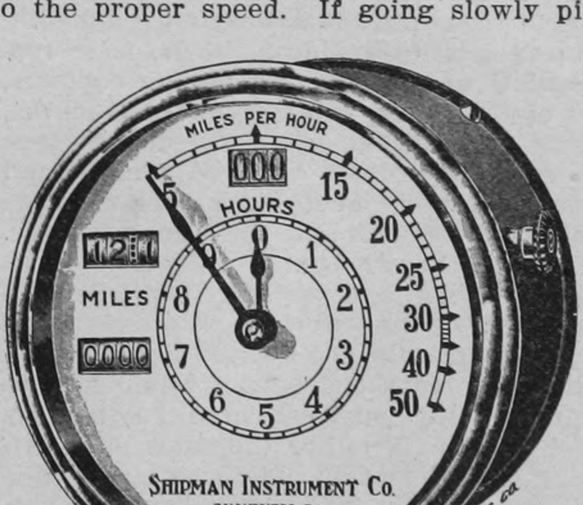
The Trouble Hunter of the Standard Automobile Supply Co., Chicago, consists, as shown, of a small electric light bulb and reflector fastened to a curved plate to fit the forehead while it is held in fore always held in position and leaves both of the operator's hands free. The



light is also in such a position that it is not thrown into one's eyes but onto the work so it does not blind. The lamp reflector and cord complete sells for $2.00.

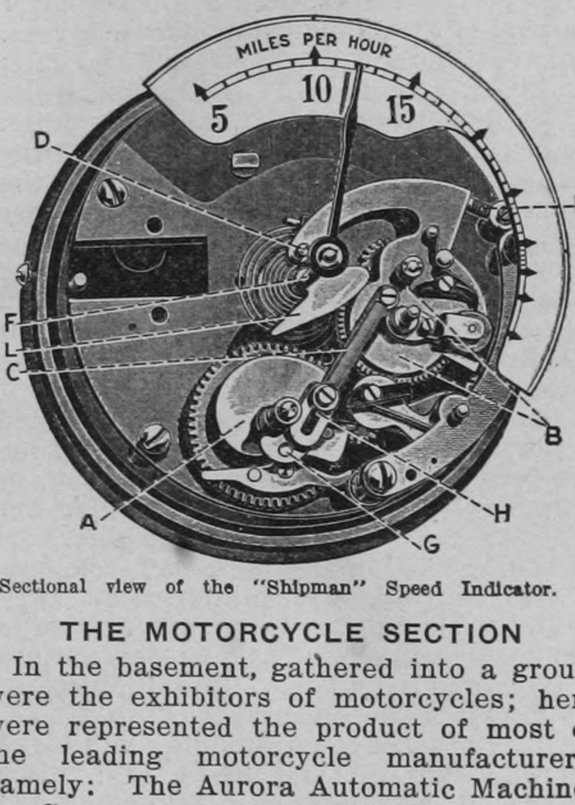
THE SHIPMAN SPEED INDICATOR

A new and entirely novel speed indicator has been placed on the market by the Shipman Instrument Co., Sunbury, Pa. This instrument resembles in outward appearance other instruments for this purpose, but the principle involved in the mechanism is new in speedometers, being based on the escapement of a clock. The power for its operation is taken from the auto wheels by a flexible shaft as usual, no winding being required. The position of the hand at the end of each 1-30th of a mile traveled is determined by pin D bringing up against cam L by the action of a hair spring. The arm carrying pin D is pulled toward cam A by a spring C, but its movement is made uniform by the action of an escapement so that pin D only travels a short distance if the car is going at speed before cam L is released and the two meet, thus the hand points to the proper speed. If going slowly pin



The time of releasing the cam L is s arranged that at the end of each 1-30t mile the indicating hand moves slightl before settling on the speed for that 1-30t of a mile. This motion can be made almost imperceptible if desired, but it ha been found that when running at spee and toward dusk this slight movemen of the hand catches the eye an makes the instrument more easy to read

These instruments sell for $35 and $50 The $35 has trip hours, while the $50 ha the trip and season hours. They are guaranteed as to accuracy and reliability an if at any time within 3 years they giv trouble the makers will remedy it. The dimensions are 3¼ dia. by 2in. height with the usual polished brass case an bevel glass top. The dial is white with large black figures.



Sectional view of the "Shipman" Speed Indicator.

THE MOTORCYCLE SECTION

In the basement, gathered into a group, were the exhibitors of motorcycles; here were represented the product of most of the leading motorcycle manufacturers, namely: The Aurora Automatic Machinery Company, Merkel-Light Motor Company, Harley-Davidson Motor Company, N. S. U. Motor Company, Hendee Manufacturing Company, Excelsior Supply Company, and the Wagner Motor Company. There was a noticeable difference between the attendance in this department at this, the first show in the South, as compared with the crowded aisles of the New York and Chicago Shows. However, the little fellows are, with the larger cars, making their entering wedge into the Southern districts. Many agencies were placed and some makers reported a considerable sale of individual machines.

Some features which we have for a long

positive mechanical oiling. The new Indian, with its spring fork, two speed gear and plunger pump lubricator, attracted considerable attention. This model is illustrated and described in the Motorcycle Department of this issue.

The Aurora Automatic Machinery Company, on its single cylinder 4 H. P. model, showed a new triple rotating plate, mechanical lubricator of ingenius design.

Two new Merkel models, a single and a twin, were shown. These were the first machines to be fitted with mechanical lubricators. A feature of the battery arrangement on one of these models was the ease with which the batteries can be renewed when necessary. Some of the models were shown in orange hue, although dark blue is still the standard color.

The Harley-Davidson showed some changes in the engine mounting and position, the engine being vertical and having a four point suspension. New spring forks were also fitted on this model. Combination tanks were also a feature.

The Yale was represented by several new models, among them being a twin cylinder, having a bore of 3 5-32 inches and a stroke of 3 11-16 inches.

The Wagner machines retain the trussed frame and showed very little change for 1910, aside from the use of a new Heitger carburetor and slightly widened forks, to accommodate the larger tires used. The N. S. U. were represented by four models, the light weight machine and a cream colored model being much in evidence. The Excelsior was also shown with very few changes other than minor refinements.

THE BUYER'S DESCRIPTIVE INDEX

Next month we will inaugurate an entirely new annual feature which will hereafter be a part of the January number each year. We have determined to name it "The Buyer's Descriptive Index," as this name describes it more accurately than any other. It will be a classified tabulation of all the products of each of the advertisers in the January number, covering each and every article which they manufacture for the motor trade. It will give the points of merit of each article in abbreviated and concise form, and wherever possible, it will also give the list-price of the article indexed.

This feature will be greatly appreciated by our readers, whether they are manufacturers, jobbers, dealers, repair men, or simply owners of cars as it will give our readers a conveniently arranged reference for use in making the necessary comparisons for buying, which information they would otherwise have to gather from a number of catalogs at a great expenditure of time and research. The limiting of this "Buyer's Descriptive Index" to the advertisers in the January number will make it absolutely live and up-to-date; there will be no dead matter in it, and it will therefore be of very much more value than the usual list or Directory, as it will save the time and trouble which is ordinarily wasted on comparatively dead names, that is, those who are but slightly connected with the trade, or who are only manufacturing in a small way.

Those of our readers who are not regular subscribers should order their January number early from their newsdealer, or better still, should send in their subscription to the Journal to start with the January number.

THE LAW OF ADVERTISING AND SALES

The two volumes bearing this title are of sufficient importance to merit their use as a work of reference wherever sales and advertising are handled by modern methods. A reading of these volumes clearly indicates that the author and publisher, Clowry Chapman, 282 Manhattan avenue, New York City, ranks high as a student of law of business. What the sales manager and advertising man ought to know can be found in these two remarkable books.

The word "Law" in the title may suggest all sorts of dreadful mysteries to the prospective reader; but so cleverly has this usually dry subject been handled that in place of technicalities is found information plainly, but clearly, expressed. There are innumerable recitals of important facts which every business man should know. These facts are so classified as to make the publication practically a reference book. For the inexperienced, every page is a fund of valuable information, and for the best informed there is much to be learned in each chapter. Some simple contracts or letters you may be using or writing every day would be changed if you read Mr. Chapman's book. You are making grievous mistakes which may turn up unexpectedly and throw you into legal entanglements. How to avoid the most common of these pitfalls is briefly explained.

Laws relating to ideas, libels, false representation, lotteries or guessing contests, use of the mails, copyrights, trade marks, unfair competition, good will and various contracts are dealt with so simply and comprehensively as to cause the average reader to wonder at the scope of Mr. Chapman's knowledge.

Advertising and selling methods—the whys and wherefores—are all interestingly and instructively dealt with, and it is difficult to comprehend how it would be possible for any business man having any connection with either the sales or advertising department to obtain so much valuable information in such an easy manner. These two volumes will undoubtedly find a place on the desks of the managers of every up-to-date establishment, as they deserve universal recognition.

New York--Atlanta Tour

The New York "Herald-Atlanta Journal" good roads tour ended after nine days of hard running over all kinds of roadways. The distance covered was 1063 miles, the route lying through nine different States. The route taken will undobtedly be followed many times in the future by automobile tourists and in a measure, will form a highway of road communication between the North and the South. More enthusiasm has been stirred up in the South by this event, combined with the Atlanta Show and races than can well be realized by those who did not participate in any of these events, or come personally into contact with the country folks along the route. The necessity for highways suitable for automobile traffic is now felt by the South, as never before.

Of the thirty-eight cars which left Herald Square, New York City, thirty-five reached the final goal, and twenty-six finished with clean scores; an exceptionally good record considering the character of the country traversed. Seven formally withdrew from the contest for prizes, owing to penalties which made the chances of winning hopeless. They, however, continued in the tour in spite of breakdowns and mishaps. Throughout the entire route the tourists were greeted with the greatest cordiality and in almost every place where they stopped they were not allowed to pay for anything. Entertainments were frequent and in many of the Southern cities banners were strung across the streets, bearing such inscriptions as, "Speed limit one hundred miles per hour;" "Speed limit reduced to sixty-nine miles an hour," and numerous banners of welcome to the various towns. School children and veterans participated in the welcome given the tourists; the veterans of Decatur being lined up in military formation in honor of the occasion. A large delegation from the Southern capital, including Mayor R. F. Maddox and all the available motor-driven vehicles of Atlanta met the tourists at Decatur, and the escort, about five miles in length, formed with the tourists an impressive procession as they wound their way through the narrow lanes, which were all that were left of the streets owing to the thousands of spectators banked solidly on each side. The procession brought up at the Piedmont Driving Club, where luncheon was served, after which the various parties returned to their hotels and one of the most notable tours was at an end.

Twenty-six cups were awarded to those who finished with perfect scores. The winners are given below, together with the prize fund, which amounted to $1700, and was divided as follows:

CLASS 1—Cars Costing $4,001 and Over

Seven perfect scores; $301 to the class, $43 to each perfect scoree.

Thomas, John J. Woodside, Atlanta, Ga.
Thomas, J. L. Barnes, Atlanta, Ga.
Thomas, C. I. Ryan, Atlanta, Ga.
Renault, Renault Selling Agency, New York City.
Matheson, Matheson Automobile Company, New York City.
Benz, Chamber of Commerce, Atlanta, Ga.
Apperson Official Automobile Blue Book Publishing Company, New York City.

CLASS 2—Cars Costing $3,001 to $4,000

Two perfect scores, $300 to the class, $150 to each perfect score.

Franklin, W. C. Cleveland, Greenville, S. C.
White Steamer, W. C. White, New York City.

CLASS 3—Cars Costing $2,001 to $3,000

Five perfect scores, $300 to the class, $60 to each perfect score.

Premier, City of Charlotte, Charlotte, N. C.
Pennsylvania, Pennsylvania Sales Agency, Atlanta, Ga.
Oldsmobile, E. B. Douglas, Miami, Fla.
Corbin, Chamber of Commerce, Roanoke, Va.
Selden, Evelyn Harris, Atlanta, Ga.

CLASS 4—Cars Costing $1,251 to $2,000

Seven perfect scores, $301 to the class, $43 to each perfect score.

White, Board of Trade, Commerce, Ga.
White, Board of Trade, Moultrie, Ga.
White, Chamber of Commerce, Anderson, S. C.
Buick, Chamber of Commerce, Spartansburg, S. C.
Buick, William Oldknow, Atlanta, Ga.
Maxwell, Maxwell-Briscoe Motor Company, Tarrytown, N Y.
Chalmers-Detroit, Read Holliday, New York City.

CLASS 5—Cars Costing $851 to $1,250

Four perfect scores; $300 to the class, $75 to each perfect score.

Maxwell, Automobile and Commercial Association, Charlotte, N. C.
Studebaker, W. J. Stoddard, Atlanta, Ga.
Reo, R. M. Owen & Company, New York City.
Regal, E. D. Crane & Company, Atlanta, Ga.

CLASS 6—Cars Costing $850 or Under

One perfect score, $198.

Maxwell, Maxwell-Briscoe Company, Tarrytown, N. Y.

A banquet was also tendered the tourists in the ballroom of the Capital City Club by the Atlanta Reception Committee, which presented in behalf of the city two loving cups, one to the Atlanta "Journal" and the other to the New York "Herald," in appreciation of their efforts to further the good roads movement and as remembrances of the additional knot which they tied in the bond holding the North and the South together.

Atlanta's Track Races

The formal opening of Atlanta's new two-mile Speedway was accompanied by five days of automobile racing, which was attended by record crowds. Starting on Tuesday, November 9, the speed carnival lasted until Saturday and not for one race did the interest lag or the attendance diminish. It was a decided success in every sense of the word.

The big event on the first day was the 200-mile stock chassis race, although the mile time trials held the most interest. In the long race Chevrolet in a Buick took the lead at the start and was at once picked for the winner. He finished in 2:46:48 establishing a new race record for that distance.

The Marmon, driven by Stillman, was

Louis Strang, in a 120-horsepower Fiat,
aptured the honors in the time trials, cov-
ring the mile in 37.71, thereby lowering
ldfield's 43.6 Indianapolis track record.

Although hard pressed by Barney Old-
eld in his Benz, Strang finished first in
e two-mile free-for-all in 1:31.63.

John Aitken, in a National, made the
west time, 8:27.22, for ten miles in the
ock chassis race for big cars and in the
maller class, Joe Matson drove his Chal-
ers-Detroit to victory in 9:49.46.

In the ten-mile handicap the Marmon,
riven by Stillman, was given too great a
ead and the other cars did not get near it.
itken, the third man to finish, did the ten
iles from scratch in 9:12.41, which is a
ew track race record.

The summaries are as follows:

Christie. Strang was again victorious over Oldfield and completed 10 miles in 7:21.94, setting another track competition record.

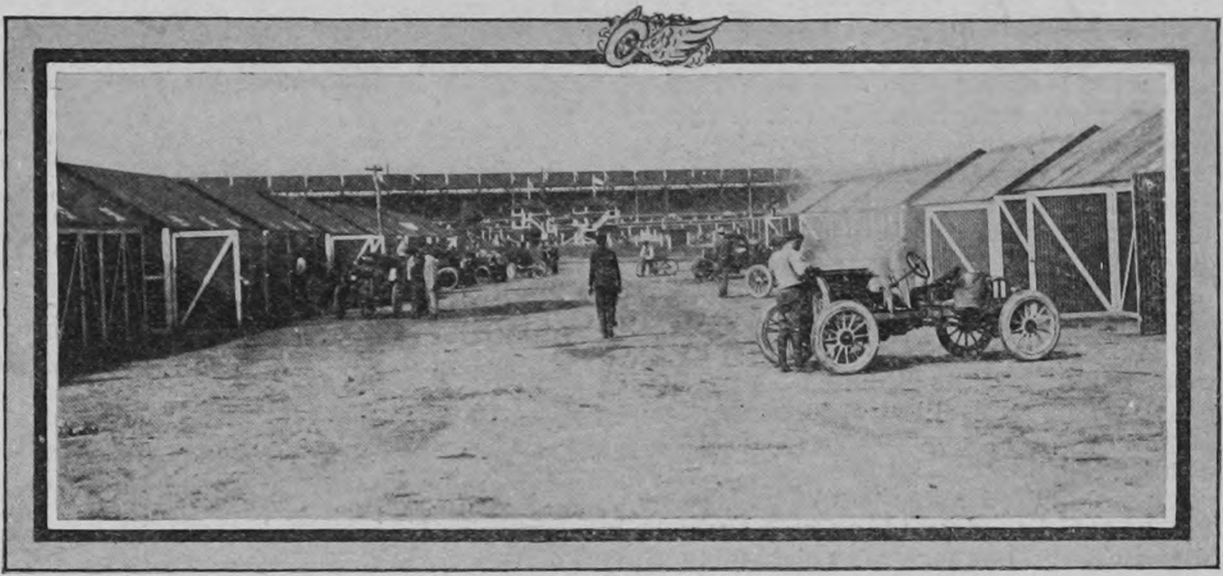
In the ten-mile stock chassis race George Robertson driving a Fiat, who appeared in the racing for the first time, and Strang, were forced to withdraw, allowing Harding, in an Apperson, to win; time 8:30.68.

W. E. Oldknow, in a Buick, won the amateur ten-mile free-for-all in 8:52.56.

The fourth victory for Strang was the four-mile free-for-all, which he won in 2:47.03.

Knipper's Chalmers-Detroit and Nelson's Buick promised to run a close and interesting race until the lack of gasoline forced Nelson to the rear.

The summaries of the second day's races follow:



View of the paddock on the infield where the cars are housed.

ONE-MILE TIME TRIALS—FREE-FOR-ALL

os.	Car	H.P.	Driver	Time
	Fiat	120	Louis Strang	37.71
	Benz	120	Barney Oldfield	40.13
	Christie	130	Walter Christie	48.82
	Stearns	30-60	J. M. Rutherford	50.85

N-MILE STOCK CHASSIS (451 to 600 Cubic Inches)

	National	40	John Aitken	8:27.22
	National	40	Tom Kincaid	8:27.71
	Apperson	50	Hugh Harding	8:50.65
	Renault	45	Charles Basle	Did not
	Stearns	30-60	John Strang	finish
	Fiat	60	Louis Strang	dropped out

N-MILE STOCK CHASSIS (161 to 230 Cubic Inches)

	Chalmers-Detroit	30	Joe Matson	9:49.46
	Chalmers-Detroit	30	William Knipper	9:49.84
	Buick	18	Joe Nelson	9:50.18
	White	20	James Rodger	Did not
	Fuller	22	John Rutherford	finish

TEN-MILE FREE-FOR-ALL—HANDICAP

	Marmon	35	Harry Stillman (60 Sec.)	8:54.96
	Marmon	32	Ray Harroun (70 Sec.)	9:05.67
	National	60	John Aitken (scratch)	9:12.41
	National	40	Tom Kincaid (25 Sec.)	9:18.25

TWO-MILE FREE-FOR-ALL

	Fiat	120	Louis Strang	1:31.63
	Benz	120	Barney Oldfield	1:37.18
	National	60	John Aitken	1:43.72
	Christie	130	Walter Christie	1:51.40

WO-HUNDRED-MILE STOCK CHASSIS (301 to 450 Cubic Inches)

TEN-MILE SPECIAL

Pos.	Car	H.P.	Driver	Time
1	Fiat	120	Louis Strang	7:21.94
2	Benz	120	Barney Oldfield	7:27.71
3	Christie	130	Walter Christie	Dropped out

Note:—Strang's time is a new record; average speed per hour 81.46 miles.

TEN-MILE STOCK CHASSIS

1	Apperson	50	Hugh Harding	8:30.68
2	Stearns	60	Louis Marquis	9:30.67
3	Fiat	60	Louis Strang	Dropped out
4	Fiat	60	George Robertson	Dropped out

TEN-MILE FREE-FOR-ALL—AMATEURS

1	Buick	30	William E. Oldknow	8:52.56
2	Stearns	30	John Rutherford	8:52.57
3	Chalmers-Detroit	30	Calvin Travis	10:02.75

FOUR-MILE FREE-FOR-ALL

1	Fiat	120	Louis Strang	2:47.03
2	Christie	130	Walter Christie	3:10.41

100-MILE STOCK CHASSIS—(161-230 Cu. In.)

1	Chalmers-Detroit	30	William Knipper	1:40:46.82
2	Chalmers-Detroit	30	Joseph Matson	1:41.52
3	Buick	18	Joe Nelson	1:43.10

THE RACES ON THURSDAY

Robertson won two events on Thursday, one the 10-mile stock chassis, for 600 cu. in. cars or under, which he won in 7:47.71.

prize, and Basle, in a Renault, third. A broken valve forced Chevrolet from first place back to fourth while he had plugged up one cylinder of his engine. He continued the race on three cylinders.

Aitken, in a National, took first prize in the 20-mile stock chassis with a time of 16:42.76, and Matson, in a Chalmers, was the winner of the 4-mile stock chassis in 4:05.52.

Rutherford, an amateur driver, captured the 10-mile event for that class and with it the Southern championship.

The 20-mile free-for-all handicap was won by Disbrow, in a Rainier. Time, 19:51.15 (2¾ min.)

3	Marmon	Stillman ..(2 min.)	20:2

10-MILE FREE-FOR-ALL—HANDICAP

First Prize, $150; Second Prize, $50

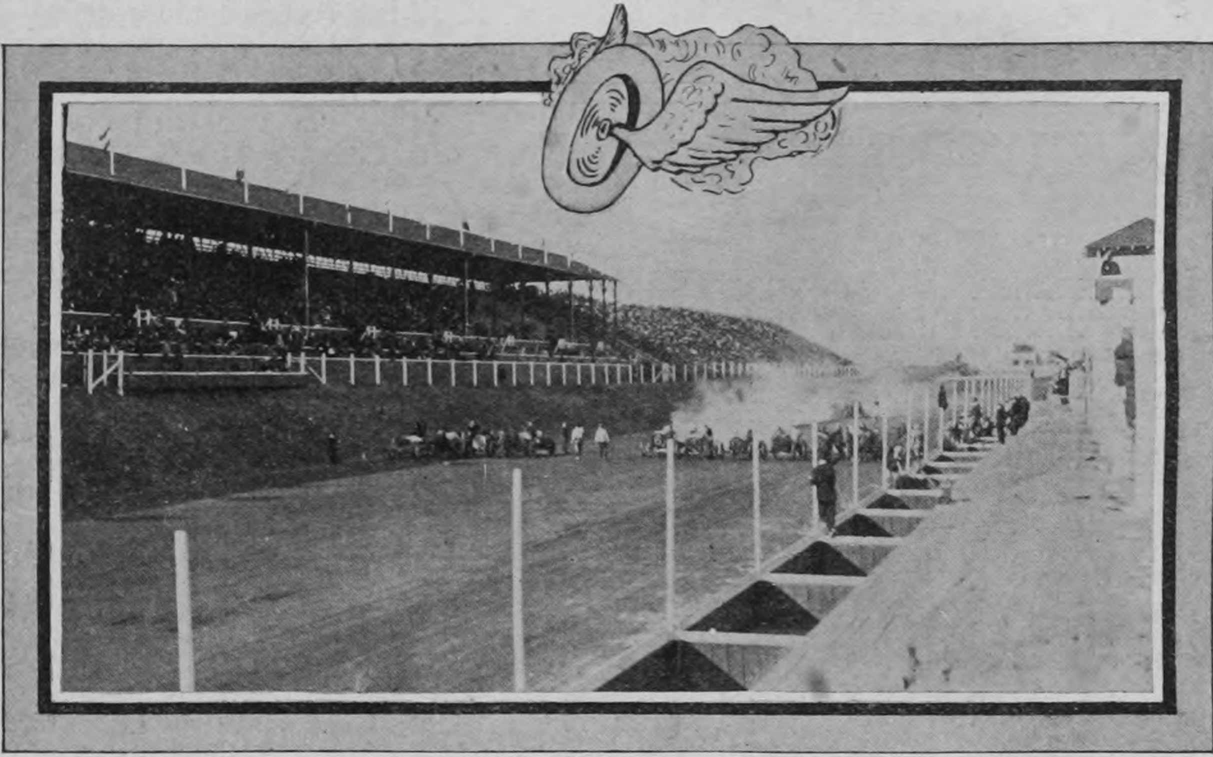
1	Fiat	Robertson ...(scratch)	8:3
2	National	Aitken ......(32 sec.)	8:5
3	Marmon	Stillman .....(32 sec.)	8:5

2-MILE EXHIBITION

Fiat	Strang	1:2

FRIDAY'S RACES

Friday proved to be a day of narrow e capes. The first accident was to the Po Toledo "Merry Widow" which, after havi been tinkered with and returned wi thanks, by several other drivers, was pil ed by Kilpatrick. After several sensatio al and dangerous escapades, the car caug fire and burned fiercely for an hour aft which it was hauled off the track a to wreck.



Start of a 20-mile free-for-all handicap, which shows the large number of cars that can be started at once necessary. This view also shows the arrangement of repair pits, grandstand and bleachers.

The summaries are:

120-MILE STOCK CHASSIS (231 to 300 Cubic Inches)

First Prize, Atlanta Auto Association Trophy and $600 in Gold; Second Prize, $300 in gold; Third Prize, $150 in Gold.

Pos.	Car	Driver	Time
1	Marmon	Harroun	1:49:26.94
2	Chalmers-Detroit	Matson	1:57:22.92
3	Renault	Basle	2:09:15.20

20-MILE STOCK CHASSIS (301 to 450 Cubic Inches)

First Prize, Cup, Second, Prize, Cup.

1	National	Aitken	16:42.76
2	Marmon	Stillman	16:46.86
3	Chalmers-Detroit	Lorimer	16:49.63

The winner's time is a new competition record.

10-MILE STOCK CHASSIS (600 Cubic Inches or Under)

First Prize, $100; Second Prize, $50

1	Fiat	Robertson	7:47.71
2	National	Aitken	8:22.87
3	Apperson	Harding	8:23.17

10-MILE STOCK CHASSIS (Amateur Drivers Only for Southern Championship)

First Prize, Cup; Second Prize, Cup

1	Stearns	Rutherford	[illegible]

Several equally dangerous acciden though ones not having such disastro results, happened to Strang, Harding a Lorimer.

Robertson again captured two even the 50-mile free-for-all and the 6-mile sto chassis. One event apiece was won Knipper, Rutherford, Aitken, Stoeck Harroun and Strang.

The summaries for Friday follow:

24-MILE STOCK CHASSIS (161 to 230 Cubic Inches)

First Prize, $100; Second Prize, $50

Pos.	Car	Driver	Tim
1	Chalmers-Detroit	Knipper	23:4
2	Chalmers-Detroit	Matson	23:4

24-MILE STOCK CHASSIS (Amateur Drivers)

First Prize, Kriegshaber Trophy

1	Stearns	Rutherford	20:3
2	Pope-Hartford	Kiser	

12-MILE STOCK CHASSIS (301 to 450 Cubic Inches

First Prize, Cup; Second Prize, Cup

1	National	Aitken	10:0

20-MILE HANDICAP (New York to Atlanta Run Cars)

First Prize, Cup; Second Prize, Cup

1	Benz	Stoecker	20:36.86
2	Matheson	Whalen	21:15.60
3	Renault	Shaab	21:55.83

10-MILE HANDICAP (231 to 300 Cubic Inches)

First Prize, Cup; Second Prize, Cup

1	Marmon	Harroun	9:51.01
2	Chalmers-Detroit	Matson	9:51.23

50-MILE FREE-FOR-ALL

First Prize, $500; Second Prize, $250; Third Prize, $100

1	Fiat	Robertson	40:14.02
2	National	Aitken	43:11.41
3	Marmon	Stillman	43:30.56

2-MILE FREE-FOR-ALL

First Prize, $200; Second Prize, $100; Third Prize, $50

1	Fiat	Strang	1:34.47
2	Christie	Christie	1:41.71
3	Fiat	Robertson	1:42.30

THE LAST DAY'S EVENTS

The drawing card on Saturday was the 200-mile stock chassis race. This was won by Disbrow, in the Rainier, with a time of 2:53:48.32. Of the other five events Chevrolet captured two and Knipper, Harroun and Aitken each one. In a two-mile exhibition trial Strang made the lap in 1:22.07.

The following are the summaries:

..200-MILE STOCK CHASSIS (451 to 600 Cubic Inches)

First Prize, City of Atlanta Trophy (Which Must Be Won Three Times to Become the Property of the Entrant) and $1,000 in Gold; Second Prize, $500 in Gold; Third Prize, $300 in Gold; Fourth Prize, $200 in Gold

Pos.	Car	Driver	Time
1	Rainier	Disbrow	2:53:48.32
2	Fiat	Robertson	2:57:47.05
3	Renault	C. L. Basle	2:58:43.93
4	Renault	L. Basle	3:13:41.87

12-MILE STOCK CHASSIS (301 to 450 Cubic Inches)

First Prize, $100; Second Prize, $50

1	Buick	L. Chevrolet	10:12.66
2	Chalmers-Detroit	Dingley	10:28.83
3	Chalmers-Detroit	Lorimer	10:37.76

10-MILE STOCK CHASSIS (231 to 300 Cubic Inches)—HANDICAP

First Prize, $100; Second Prize, $50

1	Buick	A. Chevrolet	9:03.18
2	Marmon	Harroun	9:10.07
3	Chalmers-Detroit	Knipper	9:18.09

10-MILE STOCK CHASSIS (161 to 230 Cubic Inches)

First Prize, Cup; Second Prize, Cup

1	Chalmers-Detroit	Knipper	10:41.06
2	Chalmers-Detroit	Matson	13:35.73

6-MILE STOCK CHASSIS (231 to 300 Cubic Inches)—HANDICAP

First Prize, Cup; Second Prize, Cup

1	Marmon	Harroun	5:40.83
2	Chalmers-Detroit	Knipper	5:41
3	Chalmers-Detroit	Matson	

8-MILE FREE-FOR-ALL—HANDICAP

First Prize, Cup; Second Prize, Cup

1	National	Aitken	7:42.73
2	Rainier	Disbrow	7:48.63
3	Fiat	Robertson	7:59.50

2-MILE EXHIBITION

Fiat	Strang	1:22.07

A NEW FEATURE

The next issue of the Cycle and Automobile Trade Journal will contain a new feature called The Buyer's Descriptive Index. The January number of the Cycle and Automobile Trade Journal has been regarded for many years as the year book of the trade, and this new feature will be an improvement on the old features of this January number; it will increase its value a hundred fold to our readers. It will be a condensed buying reference, containing a classified tabulation of all the products of each advertiser, giving the essential points of merit of each, and also the list-price. Don't fail to get your order in early for this number. Further description of this special feature will be found on pages 200, A, B, C and D.

Look up pages 200, A, B, C, and D, this issue, for full information regarding "Buyers Descriptive Index," which will be the improved feature of the 1910 great January special issue of the Cycle and Automobile Trade Journal. It is worth the trouble.

Will Soules, a well known racing driver, will have charge of the Testing Department of the Croxton-Keeton Motor Company, Massillon, Ohio.

An automobile factory is being erected in Oswego, N. Y., by W. H. Ives. The new building is being erected on East Main street, and is 40x190 feet with a wing 40x 93 feet.

J. C. Matlack, vice-president and general manager of the Michelin Tire Co., Milltown, N. J., has resigned those offices and severed connections with the company. He is to become identified with the General Motors project.

The Motz Clincher Tire & Rubber Co., of Akron, have brought suit in United States circuit court at Cleveland, against the Swinehart Clincher Tire & Rubber Co., also of Cleveland, on an alleged infringement of their tire patent.

The newly organized Texas Automobile Association not only proposes to see that its members are not imposed upon in the various localities which they may traverse; but also "to insist that the State authorities prosecute reckless drivers of all vehicles," and to put a stop to the pet practice of the "road hog" wherever found.

During the recent visit of the Japanese Industrial Commission to Cleveland the Hon. Sakutaro Satake, M. P., president of the Tokio Electric Light Co., with a party of mechanical experts visited the factory of the Baker Motor Vehicle Co., and after a critical inspection of the plant placed an order for a Baker Electric Victoria for his personal use in Tokio.

November 1st the advertising office of The White Company was moved from 1402 Broadway, New York City, to the White factory, 800-898 East 79th Street, Cleveland. R. H. Johnston, who for the last six years has been in charge of the advertising and publicity affairs of the company, continues his duties as advertising manager at the new address.

A 12 H. P. Maxwell runabout, the same which only a few days previous had won the principal trophy in the New York-Atanta good roads tour, and completed the Savannah-Atlanta endurance run with a perfect road score gave a most remarkable hill climbing feat by climbing to the top of Stone Mountain near Atlanta, Ga. This mountain is fully 1800 feet above sea level, and it is claimed the summit has never before been reached by any sort of conveyance.

GROWTH OF AUTOMOBILE CLUBS

The list of the state associations and clubs affiliated with the American Automobile Association, recently compiled by Secretary Frederick H. Elliott, shows a startling increase over that of last year. The growth in state associations during the past year has been particularly marked, there now being associations in 31 states, this including, however, the Hawaiian Associations. In respect to membership the New York State Association leads with 4,518 members, the Pennsylvania Motor Federation coming next with 3,113 and the Associated Automobile Clubs of New Jersey, third, with 2,156. Six organizations have a membership of over one thousand; Minnesota, Ohio, Southern California, Illinois, Massachusetts and Connecticut. Among the large number of clubs affiliated with the National Body the latest statistics show that forty have a membership of over one hundred. The Automobile Club of Buffalo heads the list with 1,827 members, followed by the New Jersey Automobile and Motor Club with 1,274, while the Automobile Club of Philadelphia is just short of 1,000. The Automobile Clubs of Chicago, Minneapolis, Cleveland, Long Island and Rochester each have over five hundred.

ANDERSON CARRIAGE CO. ABSORBS ELWELL PARKER ELECTRIC CO.

More evidence of the rapid strides Detroit is making in the automobile industry was recently produced by the Anderson Carriage Co., makers of the "Detroit Electric," when that concern announced that it had purchased the complete plant and business of the Elwell Parker Electric Company, located at Cleveland, Ohio, who heretofore supplied the electric motors used in the "Detroit Electric."

The sale, which involves approximately half a million dollars, does not presage the removal of the Elwell Parker plant; but, on the contrary, predicts the pronounced extension and development of the present operations.

Incidental with the purchase of the Cleveland plant the capital stock of the Anderson Carriage Company has been increased from $500,000 to $1,000,000.

TWO NEW BUILDINGS FOR MAXWELL CO

To meet the ever increasing demand for Maxwell cars the Maxwell-Briscoe Motor Co., of Tarrytown, N. Y., has again been compelled to increase its manufacturing capacity. The latest acquisitions are the factory of the Tarrytown Tile Works, with a floor space of 62,520 square feet and the recently erected bass foundry, having a floor space of 21,500 square feet. A new aluminum castings plant having over 40,000 square feet of floor space is at present under construction. The company now controls six plants, and with the completion of those now in course of erection will employ nearly 6,700 employees.

FINAL PLANS FOR PHILADELPHIA AUTOMOBILE SHOW ARRANGED

The ninth annual exhibition of automobiles under the auspices of the Philadelphia Automobile Trade Association will be held in the Third Regiment Armory Building, Broad street below Federal, the two weeks of January 17-29, 1910. This year's exhibition will constitute two shows, the exhibitors of the first week retiring on January 22, 1910, and a second section of exhibitors taking their place on January 24, 1910.

The plan as outlined at present is to have the first week an exhibition of pleasure cars only, while the second week's exhibition will consist of the overflow of pleasure cars that were unable to get space in the first week and the commercial vehicle display and the motor accessories. Mr. J. Henry Beck will, as usual, manage the exhibition, and has his office in Room 216, Odd Fellows' Temple, Philadelphia, Pa.

GRAHAM VS. FURMIDGE DECISION

The Patent Office at Washington, D. C., on October 30, 1909 rendered a judgment in favor of the St. Louis Supplementary Spiral Spring Co., against John Hector Graham in the Interference entitled "Graham vs. Furmidge," which involved an application for a patent filed by John Hector Graham, December 19, 1907, and the Furmidge patent No. 807,612 which by assignment from Furmidge is owned by the St. Louis company. As a result of this decision the New York office of the St. Louis Supplementary Spiral Spring Co. has filed suit in the United States Circuit Court in New York City, against the said John Hector Graham, and the Graham Company, doing business under the name Supplementary Spiral Spring Company, at room 214 Motor Mart Building, 1876 Broadway, New York City, for infringement on their patents No. 807,612, dated December 19, 1905 and No. 901,578 dated October 20, 1908.

Cryder & Company, of Park Avenue and 63rd street, New York City, advise us that the United States Patent Office have allowed the full patents on the Ronson Nine-in-one wrench.

The tool referred to, which was described in our columns, November issue, page 195, is a concentration of nine standard wrenches in a half pound weight and a six inch length, and is of intense convenience, by reason of this fact, to all automobile, motorcycle and motorboat users.

JACKSON HOLDS HOUSE WARMING

The recent completion of an addition to the Jackson automobile plant at Jackson, Mich., 250x67 feet in size, three stories in height, and with a roomy basement, was made the occasion for a celebration such as was never held there before. About 600 employes, their families and especially invited guests were present and distinctions were laid aside. Employer and employe sat side by side at the lunch table, enjoyed the music and danced together, and the universal participation in the festivities recalled the harmonious relations which have always existed between the Jackson company and its employes.

CONTAINS LIVE CONCERNS ONLY

Inasmuch as The Buyer's Descriptive Index, the new feature which will appear in the January number of the Cycle and Automobile Trade Journal for the first time, will be confined to the products of the advertisers in that number it will be absolutely free from dead or obsolete information, and as all of the more prominent progressive concerns in the trade are regular advertisers in the Cycle and Automobile Trade Journal, and the products cover nearly everything which is desirable for the buyer, it will be complete and a great time saver as no time will be wasted in looking up dead issues or worthless articles.

HESS-BRIGHT BEARINGS CARRY LOADS AT CONSTANT SPEEDS UP TO 3,000 R. P. M.

In the recent issues of the Motor Cycle, Motor Boat and Automobile Trade Directory there was a typographical error in the data concerning Hess-Bright bearings, which were stated to be "safe for steady speeds and constant loads up to 300 R. P. M." This should have been 3,000 R. P. M. instead of 300 R. P. M., and as this is a very important difference we take this means of drawing the attention of the trade to this correction.

"OVERLAND IN AN OVERLAND"

Dr. F. E. Tully, together with his wife and son, made a two months' trip from St. Louis to New York in their Overland runabout. They carried with them on their machine a complete camping outfit and lived outdoors as much as possible, stopping at hotels in all only about two weeks, during the times they were in such big cities as Chicago, Cleveland, Toledo, Buffalo, etc. In all about 2000 miles were covered, over all kinds of roads and during all kinds of weather. No trouble whatever was experienced with the car and the trip was thoroughly enjoyed by all.

Full particulars of "The Buyer's Descriptive Index" are given on pages 200, A to D, of this number—don't fail to investigate.

MAXWELL TO BUILD AT DETROIT

Detroit, the center of the "Automobile World" is to have still another auto plant. It is reported the Maxwell-Briscoe Motor Co. is going to build their "Plant No. 5" somewhere out on the Grand Trunk Railway line at Detroit. The Maxwell Company's other four plants are located, one in Tarrytown, N. Y., one in New Castle, Ind., and two in Rhode Island.

The "Metz Plan Car" recently made a 24-hour endurance run over the Lexington Five Mile Course, covering in 23 hours, 49 minutes, 460 miles, which although by no means anything near a record is a very good showing considering the small car, almost impassable condition of the course and the bad weather. The gasoline consumed during the run was 13 gallons, 1 quart, and the oil used was 6 quarts, and one pint. The showing which the "Metz Plan Car" made amply bears out the contention of its manufacturers, that the car is thoroughly practical and serviceable.

MACHINE CO. TO INCREASE PLANT

Blood Bros.' Machine Company, of Kalamazoo, Mich., is completing plans for increasing its capacity and the output of its plant. The capital stock of the company has been increased from $15,000 to $75,000, of which $40,000 has already been paid in.

During the past year the company has doubled its working capacity by installing a large amount of new machinery. The working forced has also been practically doubled. This has been made necessary by the steadily increasing business of the company.

The entire plant at the present time is devoted to the manufacture of universal joints of which they make several different styles of both the encased and center block types and a great variety of sizes of both single and double joints.

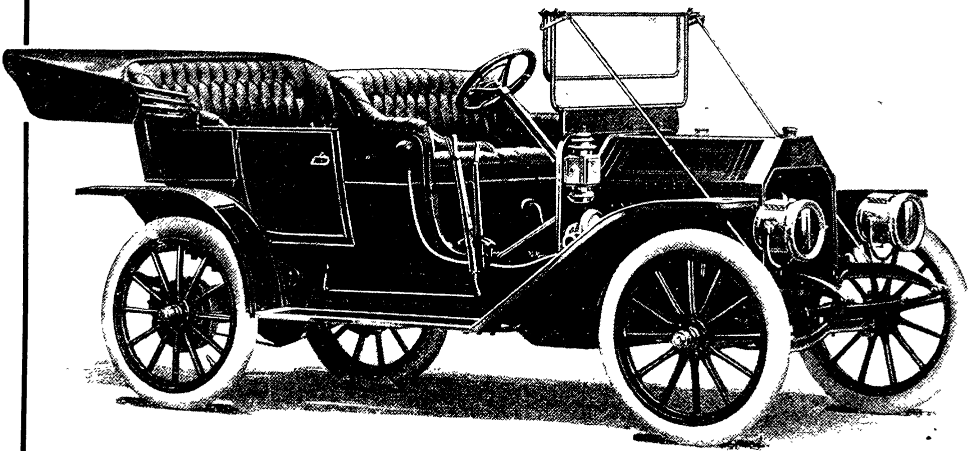
"Automobile Troubles and How to Remedy them," by Charles P. Root.

The above is the title of a new book written by Charles P. Root, and published by the Charles C. Thompson Co., 338-346 Wabash Avenue, Chicago. The book is pocket size, 5x7 inches, and contains 225 pages, fully illustrated with specially prepared drawings. It is handsomely bound in flexible leather, round corners, and lists at $1.50. The book treats almost entirely on repairs and adjustments, and the subject of overhauling is also taken up and discussed at great length.

CARTER CARBURETOR CO. FORMED

William C. Carter, of St. Louis, Mo., has incorporated, with $12,000 capital, the Carter Carburetor Company, to manufacture a new carburetor which he designed and spent 3 years perfecting. A factory has been leased at 914-18 North Market Street.

This is the MOST TALKED ABOUT Car on the Market



Because it More Than "MAKES GOOD" to its Buyers

Owners of Moline cars write our strongest advertisements. They tell from **actual experience** just what every prospective buyer wants to know—ought to know—**before** he buys.

The records of Molines in the hands of their owners is what has caused them to be the **most talked-about**, most popular cars in their class today.

Here are a few instances of the wonderful performance of the

4 cylinder
30 H. P.

Moline

Price, $1500

EQUAL CARS COSTING DOUBLE

Chicago, Sept. 18, 1909
Moline Automobile Company

I have been using one of your Model "M" cars since May first, and have run it about 5000 miles. Today the car is running perfectly.

I took a friend of mine riding recently who owns a 1909 Peerless, and he admitted that my Model "M" Moline ran just as well as his Peerless.

This car is very satisfactory, and I take pleasure in recommending same. Yours very truly,

A. J. PRUITT
145 La Salle St.

SEE THE REAL THING

We have a complete exhibit of our 1910 Models, also Motor Parts at the

New York Show

Grand Central Palace

December 31st to January 7th

You are especially invited to come and personally inspect this popular car—it will surprise you.

NEVER TOUCHES TOOL TO IT

Williamsburg, Iowa,
Sept. 14, 1909,
Moline Automobile Company

Thinking you might like to hear from my Model "M" Moline car, I take great pleasure in stating that I put this car into active, everyday use May 11, 1909. Have used it every day and many nights over bad country roads and up to date, September 1st, over four months, have never had to touch a tool to it. I think this is up to and a little ahead of the "Glidden Tour" experience.

Very truly yours,
E. C. LONG, M. D.

Write for Catalog No. 37 You will be vitally interested in the full specifications of this unusually **sterling** car. We will also send you more proof that it is the **economical** car to buy from any standpoint. Write today.

Moline Automobile Co., 37 Root St., E. Moline, Ill.

TRADE PRINTED MATTER

The "Story of the 1909 Glidden Tour" and the Moline's Perfect Score is the title of a handsomely printed booklet issued by the Moline Automobile Co., of East Moline, Ill. The booklet, beside giving a detailed review of the Glidden tour, also contains an advanced announcement of the Moline Model "M" for 1910.

The Interstate Automobile Company, of Muncie, Indiana, has issued its 1910 catalog, which is well and neatly printed and describes the Interstate line of cars for 1910 in a concise and thorough manner.

The Davis-Bournonville Company, of New York City, has issued a catalog descriptive of its Oxy-acetylene welding and cutting apparatus. The catalog deals on the subject in detail and is profusely illustrated.

A treatise on refining crude petroleum into its various products has been published in booklet form by the Harris Oil Company, of Muncie, Indiana. The treatise explains in detail the meaning of the terms, Gravity, Fire Test, Flash Test, Filtering, Viscosity, Carbon, etc.

The Electric Storage Battery Co., of Philadelphia, has recently issued a most attractive publication on the "Exide Sparking Battery." It contains a very complete description of their well-known ignition cell and a rather unusual double-page illustration, showing its entire construction at a glance. Every feature, which makes this battery the most durable and efficient, is clearly shown.

Thomas B. Jeffery & Company, makers of the Rambler car, have recently gotten out a special edition of the Rambler Magazine, called the Dealers' Number. It is printed in colors and packed from cover to cover with snappy illustrations and instructive views, showing the best method of building and selling automobiles. This magazine very much resembles a standard publication, and although it is just a little bit better than anything of this sort ever issued before, it is being sent free to all dealers who may make request of Thomas B. Jeffery & Company, Kenosha, Wisconsin.

The Firestone Tire & Rubber Company, of Akron, Ohio, has sent out to the trade a cardboard hanger, on which is mounted a blue printed sheet, giving a table of approximate wood wheel diameters for various sizes and types of rims.

"A Month in Europe with a Pierce-Arrow Car," is the title of one of the neatest pieces of advertising literature sent out by the Pierce-Arrow Motor Car Company, of Buffalo, N. Y., for some time. The data has been compiled by an American, the owner of a Pierce-Arrow car. The booklet is fully illustrated with reproduction of post cards collected in the various cities visited. In the rear of the booklet is a map, showing the route traversed by the car.

Two new catalogues of interest to motor truck and motor buggy manufacturers, dealers and owners were issued recently by The Diamond Rubber Company, of Akron, Ohio. The first illustrates and describes in detail the Diamond wire mesh base tire for motor trucks and commercial motor vehicles of every description, and also includes the side wire type, while the second is a catalogue devoted exclusively to Diamond motor buggy special tires for motor buggies and high wheel automobiles.

Bulletin No. 116, entitled "Some Points on the Operation and Care of Exide Vehicle Batteries," has recently been issued by the Electric Storage Battery Co. of Philadelphia, Pa.

The National Brake and Clutch Co., of 16 Lawrence street, Boston, Mass., recently issued a series of booklets describing and illustrating the applications of cork inserts to all machinery where frictions are used for power transmission and wherever the elimination of belt slipping is desired.

The Motor and Manufacturing Works Co., of Geneva, N. Y., has issued two catalogs on mufflers, one describing their auto type and the other marine type. The latter catalog also describes the Reid Rational Underwater Exhaust.

The Reliance Electric and Engineering Co., of Cleveland, Ohio, has published Bulletin No. 101, entitled "The Crank Shaper." This is the first of a series of bulletins dealing with the application of Lincoln Variable Speed Motors to different types of machine tools and gives very valuable information not only regarding the power required to drive crank shapers under different conditions of work, but also compares the productive efficiency of belt driven and motor driven shapers.

The Frank Mossberg Co., Attleboro, Mass., has recently sent out advertising matter in the shape of full sized illustrations of its automobile wrenches.

"Hartford" Universal Joints are brought prominently before the trade through the medium of a catalog recently issued by the Hartford Auto Parts Company, of Hartford, Conn. This catalog is 11x8½ inches in size, and is made up from a number of bulletins, each one describing a different type of Hartford joint. The bulletins are held in the cover by means of brass paper fasteners, so new ones can be added from time to time.

The New Departure Mfg. Co., of Bristol, Conn., has recently issued a folder describing its new motorcycle brake. The folder will be gladly forwarded upon request.

The 18th Annual Edition of Hendrick's Commercial Register of the United States, is now off press. The register contains over 350,000 names and addresses of American manufacturers classified under 35,774 classifications, representing about every machine, material, apparatus or specialty required in the architectural, engineering, mechanical, electrical, manufacturing, railroad, etc., embracing everything. The book lists at $10 express paid.

An artistic book on the subject of 1910 Demountable Rims for quick detachable and clincher tires, is being distributed by the Firestone Tire and Rubber Co., Akron, Ohio. The book illustrates the operation of tire-changing with these rims, and explains why the Firestone Company has discarded its demountable rims for clincher tires exclusively, in favor of the new Firestone Demountable Rims, which permit of repeated tire changes on the road.

"Principal Automobile Routes of the United States and Canada, 1910," is the title of a route book recently compiled by H. Sargent Michaels. The book is gotten up in compact form and is noticeably lacking in hotel and general advertising. The routes give only the towns to be passed through, as well as the mileage from town to town. thus eliminating the multiplicity of instructions to turn right, turn left, cross bridge or railroad, etc., many of which are obsolete, unnecessary and misleading. The book measures 4½x6¼ inches, is handsomely bound and lists at $1.25. A. C. McClurg & Co., of Chicago, are the distributers.

The Stewart & Clark Manufacturing Company, 1848-60 Diversey Boulevard, Chicago has recently issued its 1910 catalog descriptive of Stewart Speedometers. The catalog is printed on heavy calendared paper in heavy type, supplemented by the use of well worked up illustrations.

The second edition of "The Navigator or Mariners' Guide," published by the New Jersey Paint Works, of Jersey City, N. J., is now off press. The book contains over 200 pages of valuable information for the use of navigators, yachtsmen and students of navigation. It also incidentally tells of the merits of the marine paints made by the concern. The book lists at $2.00.

You Ask:—
"Why Don't Studebaker Make Season Models?"

THE ANSWER—Because it is not only foolish, but dishonest.

FOOLISH BECAUSE it reduces the selling season from what it ought to be, twelve months a year, to a few months. Not ten per cent. of users now lay up their cars in the winter. May be a few days they can't drive, but it's got to be pretty bad going when a good car with chain grips can't navigate three times as fast as a horse.

IT'S DISHONEST BECAUSE the concern that waits till the end of a year and then bunches all the improvements together so as to make a sensational "1910" announcement, has certainly been treating its customers unfairly all season—ever since it was discovered that a certain feature was not all it should be. Time to correct that was then —just as soon as it was possible to get the new parts thru the factory after the weakness or defect developed.

FACT IS, AND YOU KNOW IT, this business has not been blessed with many engineers—men of such ability they would be recognized among engineers of the highest order. You know the origin of most automobile designers—machinists, threshing-machine men, hair-brained inventors—"wonder children."

THEY GUESSED—THEN TRIED THE GUESS on the unsuspecting buyer. When that idea proved punk they went on and tried another. That's how the season model developed. Few have stuck to the same design year after year and some of those who have, have done so because they were too stubborn to admit a fault and change it. One or two, and Studebakers leading in this, made a first class car seven or eight years ago. Weren't any freak features in it and design hasn't been changed in any important detail up to now. Just steadily, constantly, carefully improved and improved till there isn't a weak link in the chain. Studebaker dealers never have had to contend with that annual business stagnater.

STUDEBAKERS MAKE JUST AS GOOD A CAR as the best engineers the world can produce know how to make and they follow it up every minute not only in the experimental department, but after it is in the hands of owners. You know as well as we that no matter how carefully or how severely the maker may test his product, defects and weaknesses that he never dreamed of will develop when a thousand or so of that model are in the hands of owners who drive them themselves. All right. What is to be done? Why, there are two ways. One is to unload them on the poor public till they are all gone, then bring out a radically different model, admit past faults but claim you have cured them all in this later "World Beater." If present owners holler, drown their cries by hollering louder about the new model.

THE OTHER WAY IS A LITTLE MORE EXPENSIVE—at first—but it's the Studebaker way and it's the way that wins "in the long run"—and Studebakers are proverbially long winded in a race.

THE STUDEBAKER WAY is to keep in touch with the buyer. Watch for defects to develop and cure them just as fast as designers and tool makers and machines can turn out the new parts. Make 'em good at our own expense and—charge it to advertising. Which way do you, as a buyer or dealer, like best?

STUDEBAKER AUTOMOBILE COMPANY

Main Offices: SOUTH BEND, INDIANA

FACTORIES:

Detroit, Mich.
Port Huron, Mich.
South Bend, Ind.
Pontiac, Mich.
and Elyria, Ohio

Studebaker

BRANCHES:

Boston
Chicago
Cleveland
Dallas
Denver
Indianapolis
Kansas City
Los Angeles
Louisville
Minneapolis
New York
Philadelphia
Portland
Sacramento
Salt Lake City
San Francisco
Seattle
Stockton

Pavilion Hotel in Montpelier and the officers elected were: president, W. W. Brown, of Springfield; first vice president, James M. Boutwell, of Montpelier; second vice president, Dr. J. Holmes Jackson, of Burlington; secretary and treasurer, S. S. Ballard, of Montpelier; and director, G. H. Morrill, of St. Johnsbury.

Although much has been done by the club already in marking of danger points and guides, it was voted to start a campaign for the erection of suitable signs at all such points along automobile roads throughout the state and also for cross road and direction signs. It is expected that towns will co-operate to some extent in placing of crossing and direction signs, but members pledged themselves to see to it that they were placed wherever needed.

THE NEW FEATURE OF THE JANUARY NUMBER

The next issue of the Cycle and Automobile Trade Journal will contain a new feature called The Buyer's Descriptive Index. The January number of the Cycle and Automobile Trade Journal has been regarded for many years as the year book of the trade, and this new feature will be an improvement on the old features of this January number; it will increase its value a hundred fold to our readers. It will be a condensed buying reference, containing a classified tabulation of all the products of each advertiser, giving the essential points of merit of each, and also the list price. Don't fail to get your order in early for this number. Further description of this special feature will be found on pages 200 A B C and D.

The Ajax-Grieb Rubber Co., of Trenton, N. J., makers of Ajax tires, is now reported to be a million dollar concern. At the recent annual meeting of the company's directors the annual dividend was declared and it was voted to increase the capital from $400,000 to $1,000,000. An election of officers for the ensuing year also took place and all of the present incumbents were re-elected to the same offices. They are: President, Horace De Lisser; vice-president, William G. Grieb; treasurer, Harry Grieb.

H. J. Koehler purchased of W. V. Snyder the property at No. 289-291-293 Halsey street, Newark, New Jersey. This acquisition giving him a permanent home for his large automobile interests in what is

has just completed an addition to the pres room of its factory, at Hartford, Conn The building is of brick construction, 19 feet long and 28 feet wide and one stor high. The addition was made to accomo date several large presses for the vu canizing of tires.

CANADIAN REGAL COMPANY

A company is being formed by official of the Regal Motor Car Company t operate in Canada as a branch of tha concern. A $100,000 plant will be erecte and equipped at Windsor and will be unde the management of E. N. Richards, c Windsor, who will endeavor to produce, a first, five cars a day. This number wi be increased, as the demand justifies.

CARTERCAR SUES LAMBERT

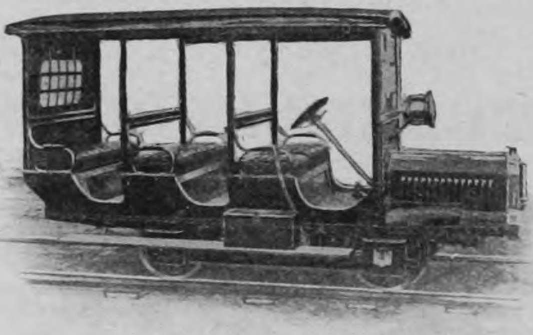
The Cartercar company of Pontiac, Mich makers of the friction driven Cartercar has commenced suit against J. B. McIn tosh as general sales agent and the Buck eye Manufacturing Company of Anderson Ind., manufacturers of the Lambert car.

It seems that suit is brought for infringe ment of certain claims of the Carter pa ent No. 761,146, dated May 31, 1904, b which the Cartercar people claim to b the first builders of successful frictio driven automobiles.

The Studebaker E. M. F. Co. has estal lished a $400,000 plant at Walkerville, Or tario, to be known as the E. M. F. Co. c Canada. The new plant will supply th trade of Canada and other British colo nies. The incorporators are Frank H. an J. Harrington Walker, Dr. J. B. Book, Chas L. Palms and Walter E. Flanders.

SPECIAL CAR FOR HARRIMAN BRANCH ROADS

PECULIAR CAR MADE FROM AUTO.



The accompanying illustration shows a special car ordere by E. H. Harriman before his death, which is to be use on a private road running from a point on the Erie Rai road to the Harriman private residence.

The car is a Lambert Friction Drive and was ordere for the purpose of ascertaining as to whether a gasolin car for from 12 to 15 passengers could be utilized mor economically than steam cars on branch roads on th Harriman lines.

As shown by the illustration, the car is

THE AUTOMOBILE CITY

The Men who have made it and What they have made

IN 1898 the city of Detroit was an active, busy little state metropolis of something over 250,000 population. The chief lines of industry were the manufacture of stoves, drugs, brass, brass goods and the diversified line of pursuits.

Automobiles were then almost as rare flying machines are now, and popularly teemed about as trustworthy. Never- eless, one day a man came along with design which he claimed was practical. ad R. E. Olds come from Lansing with e purpose of starting an aeroplane fac- ry, his chances of securing the necessary nancial backing would have been just oout as promising; yet the capital was rthcoming. In 1899 Mr. Olds had his ctory equipped and began turning out al motor cars—the first, as it proved, actical contrivances of their price and eight that the world had ever seen.

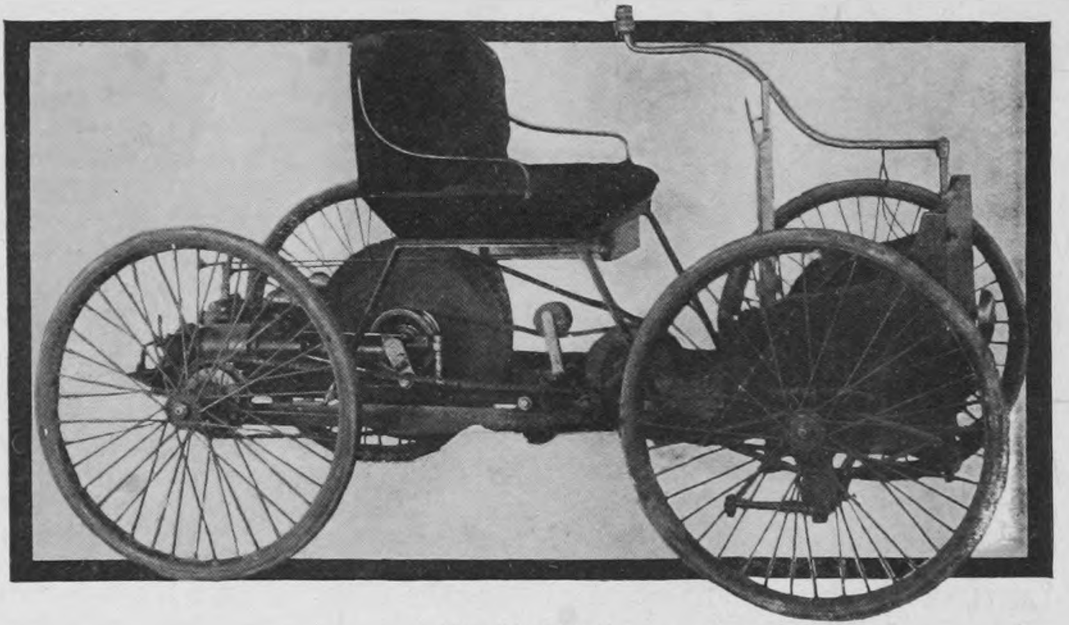
In the year that is coming to a close, etroit celebrated the decennial of its otor car manufacturing industry. From 0,000 her population had grown to very early double. From the stacks of a ore of automobile factories belched the noke of the fires that were furnishing e power to make possible the construc- on of nearly 40,000 cars, with a far larger umber sure to be produced in 1910; om nothing the automobile industry had own to be the most important pursuit the city. One family out of every fif- en draws its bread directly from the in- istry. "In Detroit Life is Worth Living," e motto of its Board of Commerce, "And

AN ELEMENT OF ROMANCE

FROM its earliest days, there has been an element of romance interwoven in the automobile industry that has been lacking in many of the other lines of manufacturing. The nature of the product itself seemed to attract to it attention and the efforts of the city's young men. The completed motor car was regarded as a poem in itself. It was a proposition which interested men to whom a stove was a dreary bit of prose, and a mere casting no more engrossing than the same amount of metal in a pig. The sensational success of the industry's early days intensified this tendency until now the first impressions of the visitors, in the average automobile factory, is one of wonder at the youth and obvious intelligence of the laborers who are guiding the big tools that are shaping the component parts of the motor cars. Fathers have urged their boys to enter the factories and have succeeded in cases without number where efforts along other lines have failed completely. It has been a young man's job, this making of motor cars, and the young men have had their hearts in it from the start.

SOLDIERS OF FORTUNE IN THE WORLD OF INVENTION

THE men whom Mr. Olds gathered about him in the first Detroit automobile factory were, like himself, little more than soldiers of fortune in the world of invention and manufacturing. From the Haynes-Apperson factory in Indiana, came J. D. Maxwell with designer of the Hudson; Morley, whose purchasing foresight was to make possible the achievement of making 10,000 cars in a year at the Ford plant; Benzer and Chapin, later factory organizers themselves—these and many others found in the head of the Oldsmobile a congenial companion and a man with whom they willingly shared their ideas.



The First Ford.

There happened to be in Detroit just then a machine shop know as Leland & Faulconer, with them the Olds Motor Co. contracted for its engines. H. M. Leland was the general manager and his right-hand man was a young genius named Alanson P. Brush. The Olds started to make its own radiator, but had trouble getting it to perform its destined duties. Two young men named Briscoe were conducting a modest factory which they called the Detroit Galvanizing and Sheet Metal Works. Ben and Frank Briscoe heard of the difficulty and made up their minds that they could construct those radiators in a way that would make them water-tight. They built one as a demonstration and then accepted the contract to equip all the Oldsmobiles. Later on this firm became known as the Briscoe Manufacturing Co. It was the forerunner of an industry that has become almost as important as the automobile industry itself—the manufacture of parts.

OLDS' SUCCESS

THE Oldsmobile built several hundred cars that first year. In general appearance they were on the buggy type. The engines were

though the company which made them ha long since left the local field and no longe produces cars of the type. there is no an American city in which the Oldsmo biles of that era are not still seen, active ly at work.

The Olds' success naturally fired the am bition of others to enter the industry Maxwell, the engineer alluded to earlie in this history, had formed an acquaint ance with Will Barbour, one of the of ficials of the immense Detroit Stov Works, which stood next door to the Old factory on Jefferson avene. Barbour use to accompany Maxwell on his trips throug the country, when he was testing out im provements on the little runabout, and be came interested in Maxwell's ideas, as we as the attractiveness of motoring. Finally he made the engineer a proposal whic was accepted and the Northern Manufac turing Company was the result, Mr. Bar bour's compatriots in the venture bein his business associates in the stove com pany. Ground was secured on Champ lain street, a few blocks from the Old plant. Operations were started in 190 In 1902, 200 Northerns were put on th market and the car disputed with the Old for local and national prestige.

FORD AND KELLEY

BUT in the meantime, all the experi means of locomotion had no menting in the gas engine as been confined to the Olds an Northern factories. As far back a 1891 Henry Ford, an employee of th ing with him on the project, had torn out a partition in the Edison Co.'s basement where the car was built, and had managed to get it outside. Kelly, too, had built a car and his intimate friends tell yet how it carried the first planetary transmission ever built or designed. Other engineers had been working independently although along similar lines. As if by common consent it seemed as if the year 1903 had been agreed on for the fructifying of the ambitions of all. The Detroit Automobile Company was formed to make cars on the Ford model. The Wayne entered the field with Kelly as engineer. Out on the Boulevard Harry Joy and his millionaire friends started the construction of the Packard factory, after purchasing an interest in that company which made it possible for them to bring it on from Warren, O. Down on the river front Ted Finch was busy adapting the ideas he had been embodying in fast motor boats, into a car with wheels.

THE CADILLAC INCEPTION

THE Detroit Automobile Company was not destined to occupy the field long. Mr. Ford's idea of manufacturing did not agree with those of the capitalists who had backed him and the two agreed to part before the season was out, Mr. Ford organizing the Ford Motor Co.. which leased a factory on Mack avenue, while the Detroit Company, without a car but with its enthusiasm to manufacture still unabated, embraced an offer of reorganization extended by H. M. Leland of the Leland & Faulconer Co., and became the Cadillac Automobile Co. The Cadillac people, at Mr. Leland's advice, requested Alanson Brush to design them a car. Mr. Brush designed the one-cylinder Cadillac, of which the company was destined to construct 20,000 before the progress of engine-building should necessitate a radical change. The Cadillac's plans were ambitious and its connection with the largest engine-manufacturers in the city led them to estimate their output at a maximum of 3,000 cars—an unheard of number hitherto. To market such a product as this required generalship of a high order. As salesman they engaged William E. Metzger, whose activities had up to date been in other lines of the industry. He had opened the first retail store in Michigan, away back in 1899, and had made it a success in spite of the fact that Olds and Locomobiles—the latter a light steam-driven car—formed all the line that he could secure. Mr. Metzger had also astonished the natives of Detroit with the town's first atomobile show in 1900—the first local show ever held—and had promoted a wierd and exciting series of automobile races at the Grosse Pointe track in the following year, 1901.

Mr. Metzger tackled the job of selling those 3,000 Cadillacs with a vim. He went down to the winter show in 1903 with a sample and came back with orders for 2,100 cars. The manufacturing world stood aghast.

THE FIRST BIG YEAR

THE year 1904 saw the first big year of the industry in Detroit. The Olds plant was at its zenith of activity, producing an aggregate of 4,000 cars. The Packard came out with its first four-cylinder model. The Ford factory was busy with its double-opposed type, and the Northern that year raised its total output to 750 cars. The Wayne had built its model car in 1903 and Roger Sullivan and Will Kelly had taken orders for 620 cars at the shows. They succeeded in getting material for only part of this number. The total output of the Detroit factories that year was not far from 9,000 cars, most of which were light runabouts or runabouts with a detachable tonneau.

ACCESSORY MAKERS INCREASE

THE sale of this unheard of quantity of motor cars and the fact that the populace seemed still anxious for more opened the eyes of the Detroit manufacturers. Although 1905 was not signalized by any important additions to the list of automobile factories it did see a large amount of capacity added to the factories where the equipment was made. Manufacturers of bodies, tops, wheels, steering gear, cranks, castings and other equipment and materials expanded to an extent where the manufacturers were able to lay out their plans for the year with some approach to accuracy. The Olds and Northern changed their scale little from the preceding year, but the Packard doubled its output and the Ford and Wayne increase was proportionally even greater than this. The sales managers began to reap the harvest of their missionary work in the advertising field and from the satisfactory performances of their cars. Automobiles would actually run. Why even ladies could drive them! They had done it all through the season of 1904 on the streets of Detroit. Some of them, it is rumored had been actually paid to do it, but their success was an excellent investment, not only in its result in increasing the field of purchasers, but also in giving the motor car a standing which it had never enjoyed in the manufacturing and financial fields. Even the conservative banking interests of the city came to regard the automobile factories as something beside wild-cat enterprises. To be sure, the croaker was always in evidence with his prediction that the industry would parallel that of the bicycle. Yet he was invariably out-argued, and meanwhile the Detroit factories produced in the neighborhood of 11,000 cars for the year.

In 1905 the Olds Motor Co., fearing a possible difficulty in securing labor, due to the increased demand for machinists and other automobile workers, moved its plant to Lansing, or it might be said two "mushroom factories" sprung up there to take its place but only to fall back into desuetude. The Cadillac increased its output, however, to very nearly 5,000 cars. Ford brought out a four-cylinder model and found it difficult to educate the buying public up to it. The Wayne featured a high-power car of the general type of the Packard, and the latter plant doubled its output. The Northern, which had lost Engineer Maxwell, who had paired off with Ben Briscoe in an enterprise, destined to become a huge success elsewhere, plodded along with its annual output of 750 cars. The totals showed a slight increase in numerical production as the Olds finished its year in Detroit. And the valuation was higher than ever before. In all probably 13,000 cars were produced at the local factories during the season. The year seemed to teach the lesson that the popular car of the era was not a large one.

In 1906 a powerful young rival of the older factories entered the field. The Thomas-Detroit Motor Co. was organized and prepared to manufacture 1907 models, and the Cartercar, a friction-driven automobile, was promoted by an active company. Neither concern did any considerable manufacturing during the season, but both placed themselves in readiness to take full advantage of the 1907 season. The loss of the Olds factory had a marked effect in reducing the number of cars made, though the valuation remained about the same.

QUANTITY PRODUCTION BEGINS

IN 1907 the wildest hopes of every manufacturer were gratified by the demand for cars. The improved system of manufacture natural to the development of the industry, was felt appreciably. The big feature of the year was, however, the famous masterstroke of the Ford which announced its purpose of building no less than 10,000 light, four-cylinder runabouts at a price hitherto unknown, even to the single-cylinder cars that had fulfilled that purpose in former years. The plans of the factory had been well laid and the work of construction under Factory Manager Walter E. Flanders, was pushed to the required notch. The car was a success and Detroit's total was raised that year to very near the 20,000 mark. The Wayne also enjoyed its biggest year, producing 1,000 cars. The Blomstrom Motor Company had entered the field and built in the neighborhood of 2,000 Queens. The Cartercar put out 500 of its friction-driven two-cylinder cars and the racy Thomas-Detroits made a pronounced success and the Brush Runabout Co., was added to the list of stable manufacturers.

A FINANCIAL CRISIS

IN 1908 came the long-awaited test ot the industry. The fall of 1907 had been featured by financial flurries and the popular prediction was, that the condition of the country's markets would not be favorable to the sale of cars the coming season. The factories to a great extent were wary and many curtailed their plans to an appreciable degree. The opening of the season found the fears realized to some extent. The Eastern market completely dropped away. The shows found the situation apathetic. But an unexpected source of strength came from the West. Apparently the farmers and Western merchants were not affected by this "Rich Man's Crisis," and had just come to the realization that motor cars were what they needed. The factories came to the knowledge of the situation too late to revise the conservative plans which had been outlined in the early part of the season. Spring found them all hard at it, to be sure, but a lot of valuable time had gone to waste, and those makers who had curtailed their output were unable to get parts. The output dropped off materially, notably at the Cadillac and Ford, which had been the leading producers numerically, the year before. The De Luxe Motor Company absorbed the Blomstrom business and manufactured a few Queens, using materials already in hand. The firm had intended to manufacture a large number of high-priced cars, but held off on account of the market. The Wayne and Northern pursued a conservative policy. The Regal was undismayed, however and appeared for the first time as a real producer. The Chalmers-Detroit succeeded the Thomas with the addition of Hugh Chalmers to its executive staff, and increased its output. In midsummer. when the Eastern situation began to clear, B. F. Everitt, W. E. Metzger and Walter E. Flanders formed the E-M-F., purchasing the joint holdings of the Wayne and the Northern. The Brush Runabout Company materially improved its car and put out 500 of them.

The year just ending has been by all odds the banner one of the industry in Detroit. The high-water mark of 1907 has been passed. Reassured by the weathering of the Wall street flurry, the manufacturers had all made large plans. The E-M-F. that had been without a factory and had not even existed in the minds of its promoters until a few months before the season's opening, has put out 8,000 cars. The Ford has been the largest producer of all, its total, running well over the 10,000 mark. The Cadillac made 6,000 cars and disposed of its plant to the General Motors for $4,500,000, every cent of which was "velvet" for the men who had backed the enterprise. The Cartercar had removed to Pontiac but the loss was not felt in view of the increased production all along the line. The Packard put out 2,300 high-power cars, another high water mark. The Anderson Carriage Co., which had made a short campaign the preceding year, doubled its output of Detroit Electrics. The Hupp Motor Co. turned out 500 Hupmobiles and Brush Runabouts to the number of 2,500 swelled the total. The Regal leaped from 500 to 3,000 and more. The Chalmers-Detroit nearly doubled its record of 1908. The Hudson, a newcomer, made 1,000 cars and the Grabowski entered the field of truck-manufacturing. The year's total foots up to nearly 38,000 cars, the majority of which are the prevailing type of light, four-cylinder model.

THE 1910 OUTPUT

IN 1910 the output of the Detroit factories will be limited only by the amount of material which can be secured by the manufacturers.. In no other season has the prospect for sales been so bright. Ford promises 17,500 cars. The E-M-F. followed the change in its directorate in which Messrs. Everitt, Metzger and Kelly disposed of their interests to the Studebakers of South Bend, by announcing an output of 15,200 cars from their original factory, and through the purchase of the De Luxe plant, expect to add 25,000 Studebaker-Flanders Twenties to this list, making them the largest producers in the city. The Brush Runabout has made contracts for material for 10,000 cars. The Cadillac expects to market 7,500. The Packard has plans laid for 3,300. The Hupp will make 5,000. The Chalmers- Detroit is hampered by construction work, but is using its new factory room as fast as it is being finished and expects to get out 6,000 cars. Five thousand is the Regal's figure. The Hudson's plans also contemplate 5,000 cars. The Anderson Carriage Co. has greatly enlarged its plant and there will be more Detroit Electrics than even in 1909. The newly organized Metzger Motor Car Co. will manufacture 2,500 Everitt Thirties before June, when it will start work on its 1911 model. The Demotcar, the Kritt, the Warren, the Anhut, and the Paige-Detroit, all new companies, are busily engaged on construction work. New buildings are under construction at virtually every plant in Detroit. The immense output of over 90,000 cars predicted can hardly be reached, say the makers of parts. Someone is bound to be disappointed. But plants are running day and night. For months the sidings of the railroads communicating with the Detroit factories have been glutted with freight-cars, coming in empty but going out, loaded with motor cars. Many of the factories at this time are running at capacity which will enable them to reach their schedule if continued through the remainder of the manufacturing season. Detroit is learning annually more about the art of manufacturing automobiles and predictions that would have been discounted in former years are more nearly capable of fulfillment now, for they are made, as a rule, by men who know.

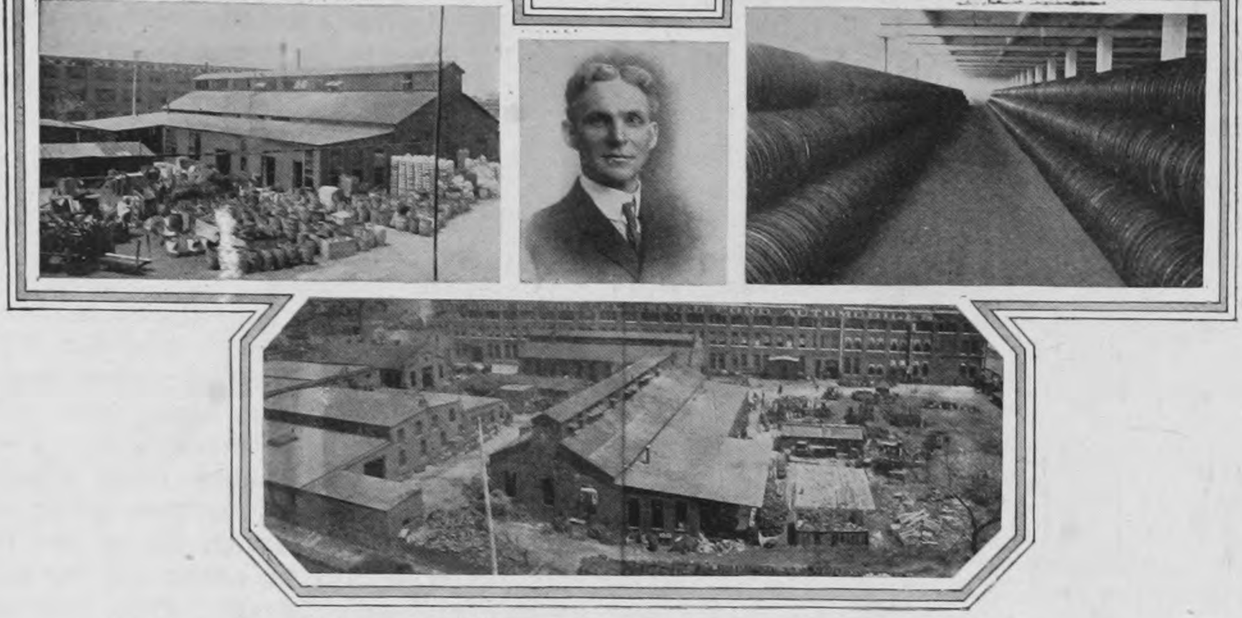
"DETROIT THE AUTOMOBILE CITY."

AND Detroit lives, moves and has her being from the motor car. People talk automobile at their business, at their luncheon, in their sleep. Grimy laborers trade factory secrets on the rear platforms of street cars on their way home from work. Every mechanic is an inventor in his odd hours and Detroit makes more applications for patents than any town of its size in the world. The rough rig of the factory tester is almost never out of sight on any well-paved street. Fifty thousand men are at work on the city's annual output of automobiles and $7,000,000 is the sum represented in the equipment of its factories devoted exclusively to the purpose.

In no industry could there exist more cordial relations between the employers and the employes than have been evident in Detroit throughout the history of automobile manufacturing. The wages have been uniformly higher, even to unskilled labor, than in any similar kind of effort. There has never been any combination of capital to lower the standard or have the workers unionized in what would have been bound to be an ill-starred attempt to raise the present scale. Open shop prevails throughout the industry, not only in the automobile factories but also in the allied industries. It would be impossible to find a better satisfied host of employes than the one which labors on the motor cars produced in Detroit.

Undoubtedly the natural advantages of Detroit have played a prominent part in the centralizing of the industry. The city's limits extend without natural boundary on three sides and cheap homes have been within reach of all. There is probably no city of its size in the country where pleasures are so cheap and so varied. Belle Isle itself, the municipal pleasure ground, has undoubtedly been of material assistance in attracting desirable workers to Detroit and keeping them there.

Detroit has had a sobriquet from time immemorial. They have called her "The City of the Straits." But people are fast forgetting the geographical cognomen. "The Automobile City" is the title by which she prefers to be known and it is a title which she surely merits and of which she is justly proud.



Henry Ford and the Present Ford Plant; showing thousands of parts which could not be placed in the buildings, stacked in the yard. In the upper right corner are seen 40,000 automobile wheels.

IN 1891 an humble mechanic in a Detroit machine shop manufactured, in his spare time, a motor car. The car didn't amount to much in the way of looks and its owner, builder and operator had some trouble in getting it to carry him about. ut it would go on occasions and it prov- d conclusively to its inventor that the gas ngine was an adequate, economical and atisfactory method of solving one of the roblems of rapid transit.

That car is now the most prized posses- ion of the Ford Motor Co., and occupies a osition of honor among the archives of he big plant. It was the first car built y Henry Ford and the first automobile ade in Detroit.

Accounts of Henry Ford's early strug- les in the endeavor to secure funds to ursue his inventive ambition and, at the ame time, to earn a living for himself and is family, are common talk about Detroit. farmer boy, but a natural mechanical enius, he had come to Detroit, a few iles away, to make his living. Running machine all day and making parts for as engines, started him to thinking on is line, perhaps. At any rate, he made ngines his study. The first car was, as ost inventions of the sort, a crude con- ivance. Working at his trade in the day, udying and working on his inventions at ght, he kept plugging away. After sev- al years of effort he discarded the lit- e buggy-like one-cylinder runabout and afted designs for a more ambitious car. and passed judgment. The years passed and, in 1901, Henry Ford designed what was probably the first practical two-cylinder opposed engine, mounted for use on a motor car. A friend who had saved a little money by running an all-night lunch-wagon on the street corner, saw the possibilities and took a chance. With the funds thus secured, Henry Ford resigned his job in the machine shop and went to work in a little one-story shed, to build his car.

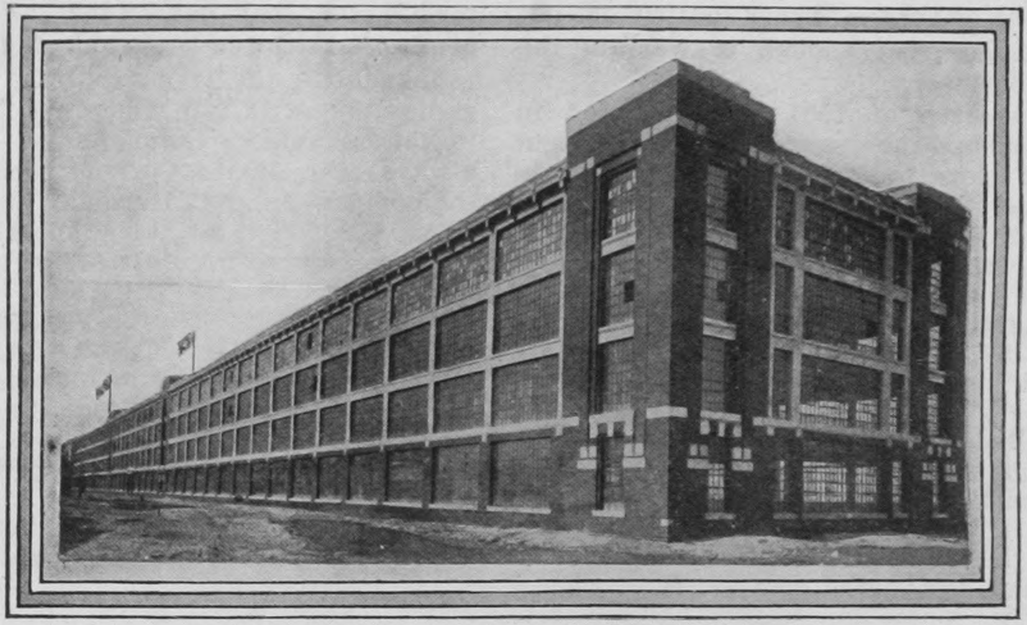
The car was finished in the spring of 1902. Ford fitted it with a seat for racing and the Detroit public saw it at the first automobile race meeting ever held in Michigan, later on in the year. Over the classic Grosse Pointe race track Ford and Alexander Winton, of Cleveland, the only entries in the free-for-all events, raced it out in a thrilling duel. Winton was at that time the track champion of the country. Ford beat him.

But even then the expected results of Ford's inventive genius were not forthcoming. Offers for the sale of his patents were made, it was true, but none of them were accepted, for Henry Ford meant to hold to his car until he could be certain of the control of its manufacture.

In 1903, backed by Tom Cooper, the bicycle champion, Ford built two more cars, perfect twins. Each, like its predecessor of the year before, was a racing car, but compared with the 1902 model, the new creation was a juggernaut. Four cylinders of enormous size gave it the power of 80 horse. When its engine started the

Ford and Cooper tried one of the cars out and were awed by its speed. Neither wanted to take the responsibility of driving it in the races of that year. Cooper, however, vouchsafed the opinion that he knew a man who feared absolutely nothing under the sun. He wired to Salt Lake City and brought on one Barney Oldfield, at that time a professional bicycle rider who had ridden with Cooper. Barney had never driven a motor car, but in a week, Cooper and Ford taught him. The day of the race arrived and the free-for-all was called. Seating himself in the middle of the juggernaut and assuming a firm grasp on the two-handed tiller by which it was steered, Barney remarked, "Well, this chariot may kill me, but they'll say afterwards that I was going like hell when she took me over the bank." Ford cranked the engine and they were off.

It was a big field but the rest were nowhere after the first half mile. Oldfield never dared to look around, but gave the car all the speed she could kick up in the straights. Nor did he shut off on the curves. He kept drawing away from his astounded field, but drove as if the others were right on his heels. His long hair snapped in the wind. He won by something like a half-mile from his nearest competitor in a three mile race.



The Ford Company's Four Story Plant.

That event convinced the world that Henry Ford was an engineering genius. In the following week a company was formed and Ford was made vice-president. He was also designer, master mechanic, superintendent and general manager. The

had demonstrated itself as an effe method of exploitation before and H Ford planned a similar demonstration his 1905 model. This came the week fore the big show in New York and place on the frozen surface of Lake Clair where, with Ford himself as the ver, the twin machine to the old " greatly improved and looking very m like a modern racer, was sent a surve mile straightaway in the record-breal time of 39 1-5 seconds.

Those who saw that effort will alw regard it as the most thrilling sight of t lives. The ice, apparently smooth, wa reality seamed with slight fissures. every one of these the car would leap the air, two wheels at a time. Fo course was a zig-zag as a result, but kept the machine generally on its cou shooting it past the finish in safety. world's record was broken by over se seconds.

The performance ensured the succes the 1905 model in the selling field. Ford Motor Co. left the rented Mack nue plant and built a factory of its own Piquette avenue. The firm devoted r of 1906 to the advance work on a m which was to mark an epoch in automo building—a light, four-cylinder runabou

In the plans for this car Henry Ford down the maxim that, by the investr of a huge sum in special machinery, cost of production of a large numbe cars at a formerly unheard-of price w be possible. The utmost care was take have the parts of the car absolutely

The manufacturing world stood aghast. nly a very few believed that Ford would rogress far with so radical a departure. ut he did. That year the Ford sprang into ne limelight as the largest producer of notor cars the world had ever known. And ne principles laid down in Henry Ford's eneral scheme are substantially those that revail in the industry to-day, except in ne cases where a firm's output is not umerically great enough to warrant the nitial expense.

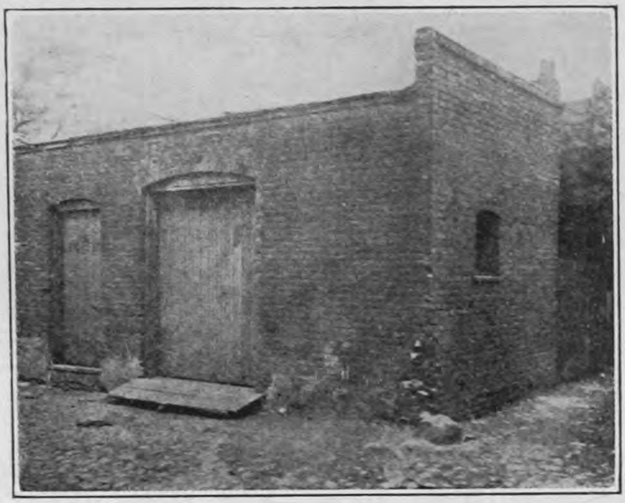
The success of 1907 was repeated in 908. During the season just closing and n even more radical lines, the same proess was repeated. During 1909 the company dropped the nanufacture of six-ylinder cars, turned out in large numbers uring 1907, and cenralized its whole energies on one our-cylinder model, f which 17,500 have een marketed.

More than a year ago it became evident that the present plant of the Ford was too small for the plans which he company had made. A large tract of land was purchased in the northern part of the city and there has been built a factory a fifth of mile long, fronting on Woodward avenue. Four stories in height, 75 feet in width and of cement and steel, the factory is one of the most modern in construction ideas. The walls are largely of glass. In the rear is an immense foundry under construction. Part of the 60-acre tract is occupied by a mile track which is now in use for testing purposes. As fast as deliveries will permit the company is installing a complete new set of machinery. Virtually none of the equipment of the old plant will be used in the new one.

And the automobile world is waiting listening to hear the announcement from Henry Ford as to the product. Whether or not he has another sensation in store is about the liveliest topic of discussion in Detroit manufacturing circles—nay even throughout the world.

In no factory organization in Detroit is his own factory organization, he is present every day in the factory laboratory. His name is now borne by 40,000 motor cars in active service. About his new factory is growing up a veritable city, made possible by his industry.

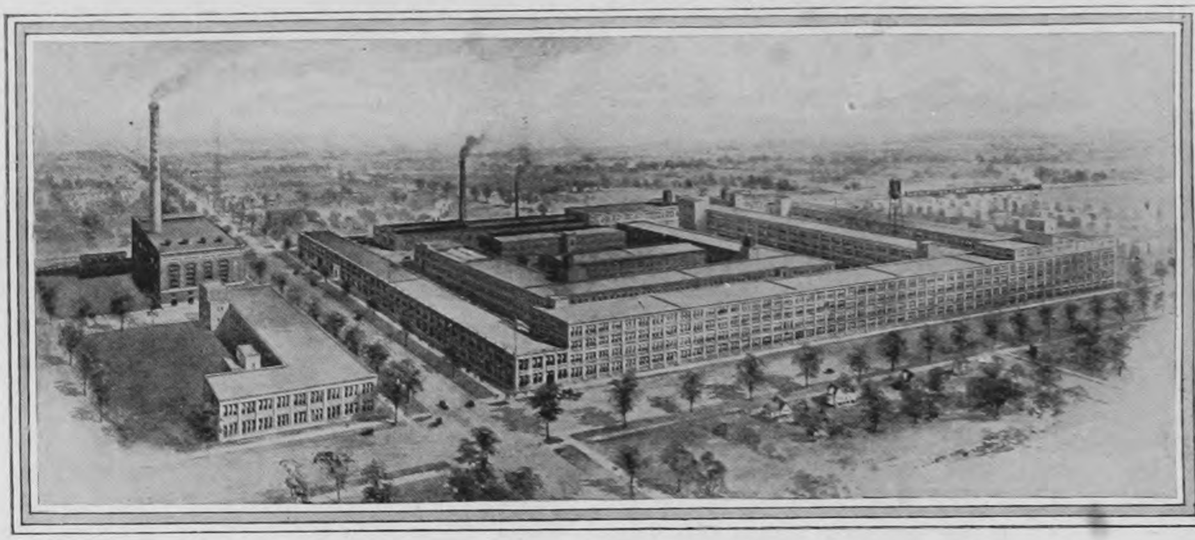
There have been several important changes in the department heads and the officers and directors of the original Ford Motor Co. But they have never affected the firm's progress to a noticeable degree. Most prominent in the support of the inspiring genius and with him since his first essay in the manufacturing field are and have always been James Couzens, secretary of the company, and C. Harold Wills, the factory superintendent. Mr. Wills was with Mr. Ford when he was building the "999." Mr. Couzens was his aide in interesting the capital that made the first Ford factory a possibility.



Birthplace of the First Ford Car.

No extended reference to the Ford Motor Co. would be complete without mention of the legal battle which the firm has waged with the Association of Licensed Automobile Manufacturers, lessees of the famous Selden patent. At the time the Ford Motor Co. was organized virtually all the manufacturing concerns in the country paic tribute to the association or its predecessors, in the form of royalties. Henry Forc balked. He had built and operated a gas propelled motor car years before the paten was granted and he refused flatly to make the payments. The association brough suit and for six years the battle has beer fought in the courts. During the seasor just closed a decision was handed down, affirming the patent. The Ford Motor Co has as yet outlined no course for the future. That it will continue to fight, carrying the case to the court of last resort, i believed certain in Detroit, in spite of the fact that the Ford has been deserted b many of its allies in the patent fight anc finds the manufacturers' organization whicl formed to assist it in the battle agains

AWAY back in the very late nineties—not as long ago perhaps, if one judges by years and not by progress—H. B. Joy purchased one of the first touring cars owned in Detroit. It was a Packard by brand, built in Warren, O., and had been constructed by J. W. Packard, a manufacturer of electrical supplies, as a sort of sideline. It was a big creation, its motor consisting of one gigantic cylinder. That one cylinder exploded its charge with remarkable regularity, however, and Mr. Joy was at once the envy and admiration of Detroit's smart set as he motored back and forth between his town home and his country place at Grosse Pointe, Detroit's little Newport.



View of the Packard Plant which now has on its payroll over 5000 persons.

Friends of Mr. Joy followed his lead and bought Packards. Three of them were, like himself, sons of millionaire fathers without whom no social function in Detroit's ultra set was really complete. Packards came to be the correct thing in motor cars in Detroit.

One day Mr. Joy called the other three together out at Detroit's famous Country Club and unfolded a plan. It was nothing more nor less than the investment of sufficient funds in the Packard factory to bring it to Detroit and start manufacturing of Packard cars on a larger and more ambitious plan. The other three were good sportsmen and the idea appealed to them as had nothing else in the many possible adventures in real business which had been proposed to them by anxious parents. Mr. Joy was selected to go ahead in the matter and he swung the deal. A large plot of

All Detroit was hugely amused at spectacle. Four of Detroit's gilded you were to start work manufacturing autor biles out on the Boulevard. Well, it wou put some idle money into circulation, marked the scoffers.

By the time the young millionaires gan to appreciate their situation, they gan to wonder how much personal eff the affair was to require on their own pa They must first select a general manag The other three got their heads togeth and determined that Harry Joy would ha to take the job. "He got us into t scheme; let him get us out," they agre and chuckled. Joy protested, but he w in the minority. The other three caucus and made "Phil" McMillan secreta

"Rusty" Alger was similarly prevailed u to become vice-president. Truman N berry pleaded to be let off on account a political campaign he was then wag which, by the way, ended in his acc ance of a position in the Roosevelt cabi as secretary of the navy. The other th let him off, but piled as much responsibi on him as they could, nevertheless.

The young Detroiters were allowed Mr. Packard to work out their own sa tion. He remained president of the c pany and is still the largest stockhol Furthermore, the policy which he had augurated down at Warren remains to day the policy of the Packard company will so remain as long as the present r agement continues. This policy is to do one thing and to do that one thing as as painstaking effort and the most lib expenditure of funds within reason

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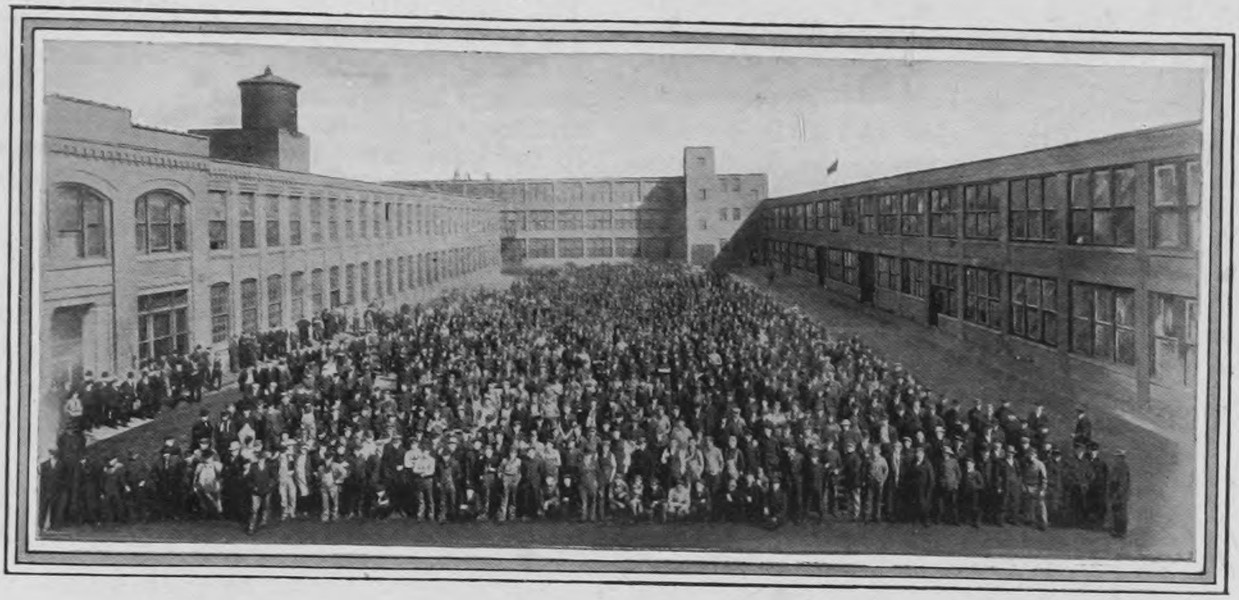
cylinder cars ever since, with the exception of the fact that each year improvements and refinements have been added, the Packard car has changed but ittle. In 1904 the Packard Co. marketed 200 cars. It could have sold several times hat number, but there was no disposition o push production beyond the point where he conservative policy laid down by Mr. Packard would be endangered.

will be ready for him. At a certain tim before the date of delivery the distributor sends in the specifications for th car. If, as seldom happens, he fails in thi respect, the company wires its other di tributors the fact that one car is unclaimed and almost completed at the factory The first distributor to wire in his clai for the car is able to delight a purchase with some unexpectedly quick action.



The Packard Company's Working Force.

People in Detroit began to sit up and ke notice. The young millionaires were aking good. The factory grew in size. 1905 it marketed 400 cars and the deand was still far greater than the supy. By this time Mr. Joy was warmed to s work. With the assistance of the suport of his directors and guided always by e advice of Mr. Packard, a definite sysm of production and expansion was agreed n. Russell Huff was chosen engineer d other departments were placed in the arge of men who were adepts in their nes. More departments were added. The ctory began to spread over the landape. It is a local proverb that, every ne the company has sold a car it has rchased a load of building material. In 06, 725 cars were produced. In 1907, 1125 rs. In 1908 the output was raised to 03. In 1909 it was 2303. In 1910 3000 stocratic new Packards will leave the ctory.

More than any other of the Packard polis developed by Mr. Joy does the selling angement appeal to the lay observer. ere has never been an unsold Packard the floor of any of the Packard com-

The expansion of the needs of motoring have caused the Packard Co. to amplify their line by the addition of a lighter car for town use and a truck. In no respect have these additions been allowed, however, to interfere with the one cardinal principle of the factory. The lighter car is a perfect replica of the standard model in every respect but size. The truck is of one model, designed for hauling freight in three-ton packages. All motors are four-cylinder and an engine improvement of one is always an improvement on the three. While the 1910 product is being manufactured testers are already at work on the 1911 and 1912.

In more ways than one it is doubtless an excellent thing that the men back of the Packard factory have been of a type to whom the immediate returns on their investment have been a matter of small moment. In no other conditions would it have been possible to build so strongly for the future. There has never been a moment since the original factory was put in operation, during which an addition has not been under construction. On Oct. 1, 1909, there were 21 acres of floor space available and in use, with fo out an assessment on the stockholders and in spite of the payments of regular dividends.

But one change has taken place in the personnel of the executive staff since the movement of the plant to Detroit. Mr. Packard in 1909 retired from the office of president and Mr. Joy was elected to this position, Mr. Packard, however, remaining chairman of the executive board. S. D. Waldon who was sales manager of the company when it was at Warren, and who had held that position until 1909, was promoted to the general management of the firm.

The Packard factory is now the largest single plant devoted to the manufacture of motor cars. Its payroll Oct. 1, included

Packard Company's Officers.

One cylinder of the new 3000-horsepower compound engine installed in the Packard plant. Reading from left to right: Chief Engineeer Russell Huff; Manufacturing Manager C. J. Moore; President H. B. Joy, and General Manager S. D. Waldon.

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the date specifie

The new foundry is merely a step in th
old policy of the firm which started in to d
one thing and to do it well.

Cadillac Motor Car Company

IN March, 1908, a committee of Royal Automobile Club, appointed for the purpose, stepped into the salesrooms of the London branch of the Cadillac Motor Car Co. and designated from a large stock of cars that had just arrived at the factory, three that were put to a test which has remained to this day the most wonderful achievement of motor-car manufacturing.

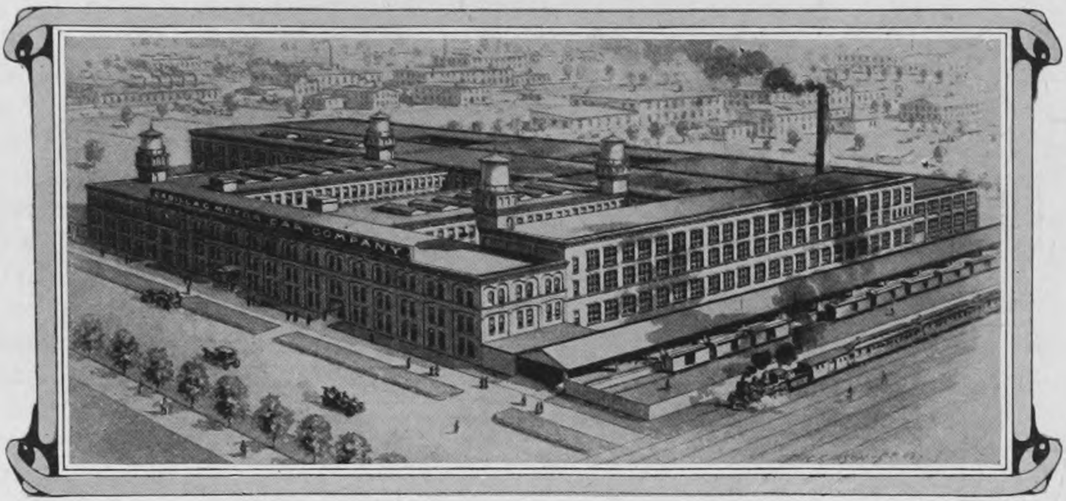
The three cars were taken to the famous Brooklands track where they were driven at speed. All three showed within a small decimal of 34 miles an hour and ability to travel at this speed as long as the fuel held out.

In quarters selected for the purpose the three cars were then taken to pieces. Carefully and methodically the work was done until not a bolt remained attached to the nut which had held it in place in the car as a component part of which it had left the factory in Detroit.

of the test then took these 2,163 fragmen
and placed them in a heap. They we
then stirred up until all possible chance
identity was lost. Then, with the on
direction a knowledge of where the piec
belonged in the mechanism of the car, b
with no means whatever of telling whic
of the three cars had contained them
the start, the work of assembling bega
Without the use of any tool but a wrenc
pistons slipped into cylinders and spindl
into hubs. What had been merely a c
lection of junk again grew into three grac
ful motor cars. The work was finally f
ished and the fuel and oil tanks fille
While the astounded audience of exper
looked on, the engines were turned ov
and each motor began singing its swe
song. To the Brooklands track, witho
even an opportunity for tuning up, the ca
were taken again.

Over the surface of that famous spee
way they were again sent at spee
Watches were snapped on the three

wires brought the news of the test Detroit. The most famous colony of otor experts in the world heard and mar- eled, as had their brother experts of urope. But at the Cadillac factory the im, old tool maker to whom the news as first communicated only smiled and uietly commented that there was no oc- sion for especial remark. Any Cadillac f the 20,000 that have passed out of the oors would have qualified as one of the hree. And he ought to know for he is he man who built them.



Cadillac Motor Car Company's Main Factory.

On November 9, 1909, the veteran H. M. eland will have concluded his semi-cen- ennial as a worker in steels. He says he egan his career with a firm to whom he measurements of the micrometer were egarded as little more than coarse. He as been with people even since, whose iews have been the same. They are now is own. When, in 1905 Mr. Leland be- ame manager of the Cadillac Motor Car o., he laid down a hard and fast rule that mery cloth and file should never be used n the assembly room of the Cadillac. A ystem of accuracy was inaugurated and rought to perfection which has formed he goal of virtually all other manufac- urers. The climax, so far as the world vas concerned, came in the famous test hich was later awarded the Dewar trophy s the most noteworthy accomplishment in he realm of motoring for the year. But Ir. Leland and his compatriots in the Cad- ac factory knew in advance what the re- ult of this test must be. The Cadillac nodels have changed since that time but very performance in standardization, redited to the little single-cylinder car, is within the scope of the "Thirties" which

1902, becoming in the following year the Cadillac Automobile Co., under which name it marketed in 1903, 2,000 single-cylinder cars. In 1905 this was changed to the Cadillac Motor Car Co., as the result of a consolidation with the Leland & Faulconer Manufacturing Co., which had formerly constructed the motors for the company, at a different plant.

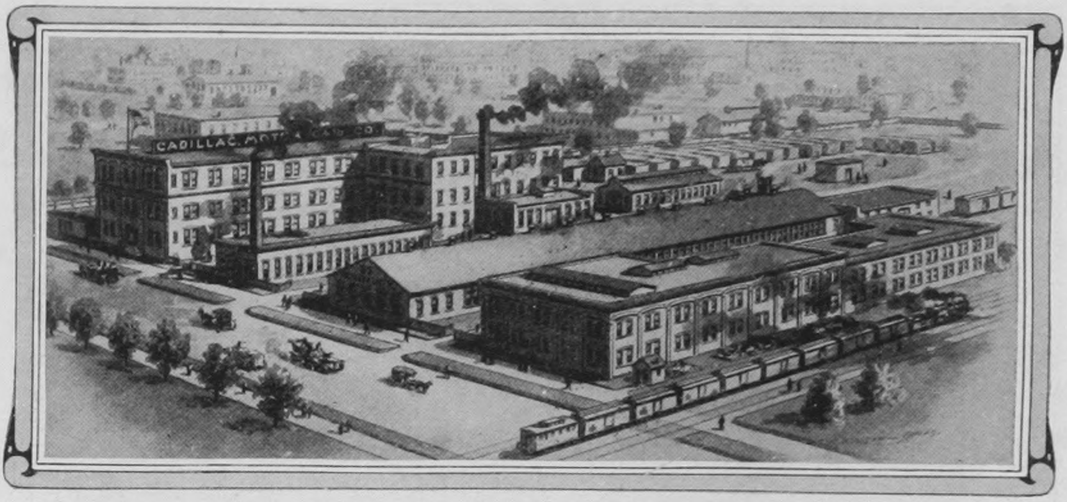
The firm scored its largest success with its 1909 model, following the advent of which, after several prior proposals had been voted down, the directors decided to accept an offer of the General Motors Co. and sold the entire plant, the sum of $4,500,000 being required to swing the deal.

Some idea of the profits of the stockholders may be derived from the knowledge of the fact that, during their connection with the company, they had invested the sum of $523,000, on which dividends to the amount of $752,000 had been paid. All the principal stockholders were Detroiters, the General Motors millions being divided chiefly among H. M. Leland, W. C. Leland, William H. Murphy, Lem. W. Bowen, A. E. F. White and Clarence Black.

The sale has made virtually no change in the policy of the Cadillac. In fact, to the casual observer, there has been no change at all. W. C. Leland has replaced his father as the general manager, H. M. Leland being present in an advisory capacity. The same general staff is in charge and the changes in the roll of employes have been no greater than would normally have been the case, had there been no change in ownership.

Due perhaps to the fact that the Cadillac was one of the largest of the pioneer fac-motor car genius, of all the Detroit factories. Time and again other firms have lured away star members of the Cadillac staff but there has been always some one to fill the vacant place and the Cadillac has pursued the even tenor of its way.

1909 built in the neighborhood of 6,000 3 horsepower cars. By making use of a possible facilities the firm expects to ma ket 10,000 cars in 1910 and for months th factory has been turning out 36 cars a da The demand has been, however, far in e


CADILLAC MOTOR CAR CO.

The Cadillac Company's Trombley Ave. Plant.

The present Cadillac factory is of brick construction, three stories in height and occupies virtually an entire block, bounded by the Michigan Central tracks and Amsterdam, Cass and Second avenues. The company also owns the block between the factory and Woodward avenue and occupies the front portion of this with the local retail branch. The land intervening is occupied by a number of long sheet iron stock rooms, but rumor has it that, in the near future, a four-story factory building will be erected on this property, with overhead communication with the main plant.

cess of the factory's capacity and the sale department created one of the sensation of the fall season by cutting off its li nearly half of its distributors of 1909, i the effort to centralize its efforts and pr vide with cars the main centers of th selling trade.

Though the Cadillac has now centered it entire energies on the production of its 3 horse power model, it is the proudest boa of its selling force that, so far as it ha any knowledge, every one of the 20,000 si gle cylinder cars so prominent in the mo toring of recent years, is still in runnin order and in actual use.

Regal Motor Car Company

For many years the Clayton & Lambert Manufacturing Co. of Detroit, has manufactured virtually 90 per cent. of the world's output of plumbers' fire pots and torches. When the automobile industry sprang into being in Detroit, their foundry which is equal in capacity to anything west of New York, was heavily drawn on for castings of all sorts by the various manufacturers. These demands, coupled with the firm's big trade in its specialty, kept its force so busy that not until 1907 did the idea occur forcibly to the firm that it might be profitable to them to manufacture cars themselves.

An addition was constructed to the original plant and Earl W. Winans, a competent engineer and designer was placed

Like many another factory that outpu of the first year did not entirely satisfy th manufacturers of the car. Unlike som other firms, the Regal Motor Car Co., how ever, did not make use of the money deri ed from the sale in improvements on th models of the following year. They perso ally called in every one of those 50 cars a the end of the season and furnished eve one of the purchasers with a brand ne 1908 model, absolutely free of charge. Th 1908 models filled every requirement o the manufacturers and users alike. Wit this beginning the Regal Motor Car Co. lai down a policy which has been maintaine ever since. It takes care of the purcha ers of its output. On several occasions nited States and the 1910 models are be- g delivered as rapidly as the railroads can eight them away. The company expects keep up its 1910 run until 3,000 cars of 30-horsepower model have been deliver- .

The New Regal Plant.

dministration building on Piquette Avenue next to Ford. The factory runs back a block to the Belt Line Track.

A fine new factory building has been nstructed on Piquette avenue, directly ongside the plant of the Ford Motor Co. d adjoining the Clayton & Lambert plant. 20 and a 40 horsepower model are now ng perfected and the company is plan- g on manufacturing no less than 11,000 rs in 1911 and is making all necessary eparations for the task.

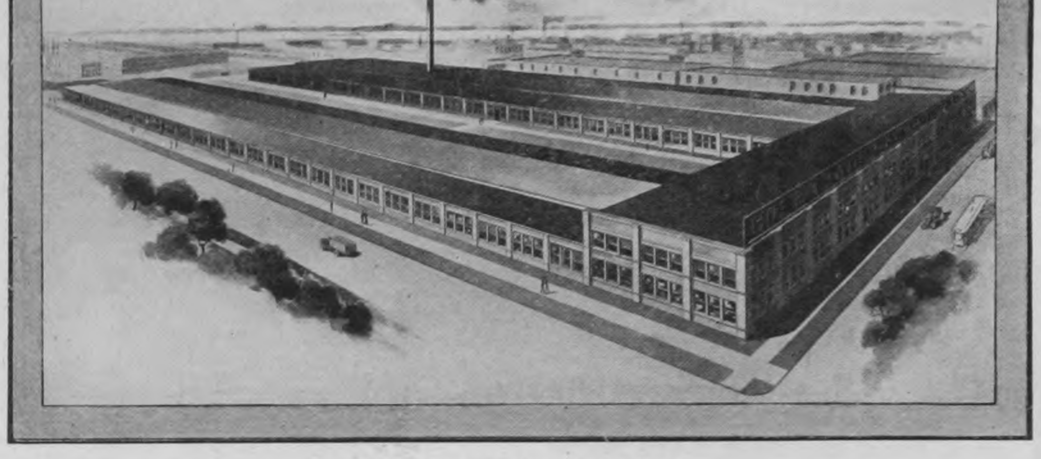
Virtually to a man the officials of the Re- Motor Car Co. are identical with those the Clayton & Lambert Manufacturing C. R. Lambert is president, Fred W.

its deeds would be incomplete without recalling the remarkable transcontinental trip made by the "Regal Plugger" in 1909. In this, the first of the 1910 models Geo. D. Wilcox, the Regal distributor in Syracuse, N. Y.; Richard N. Byrne, a Syracuse attorney, and Driver Wm. Smith from the Regal factory, left New York at noon July 5 and made the trip to San Francisco in 30 days, having covered 4,031.5 miles with the car in as good condition as at the start. The trip was in no sense a speed trial, but was merely made in ordinary touring conditions and at a time of year when the middle western roads were in terrific condition. The trip attracted great attention all along the route and served as a most prominent means of placing the car in its proper light before the public.

The Hupp Motor Car Company

AWAY back in the days of 1902, when the Olds Motor Works was the only producing Detroit make of motor cars, R. C. Hupp decided to cast his lot with the industry in which he saw a future. As many educated young men in Detroit have done ce, he entered the Oldsmobile factory a common laborer. He was pro-

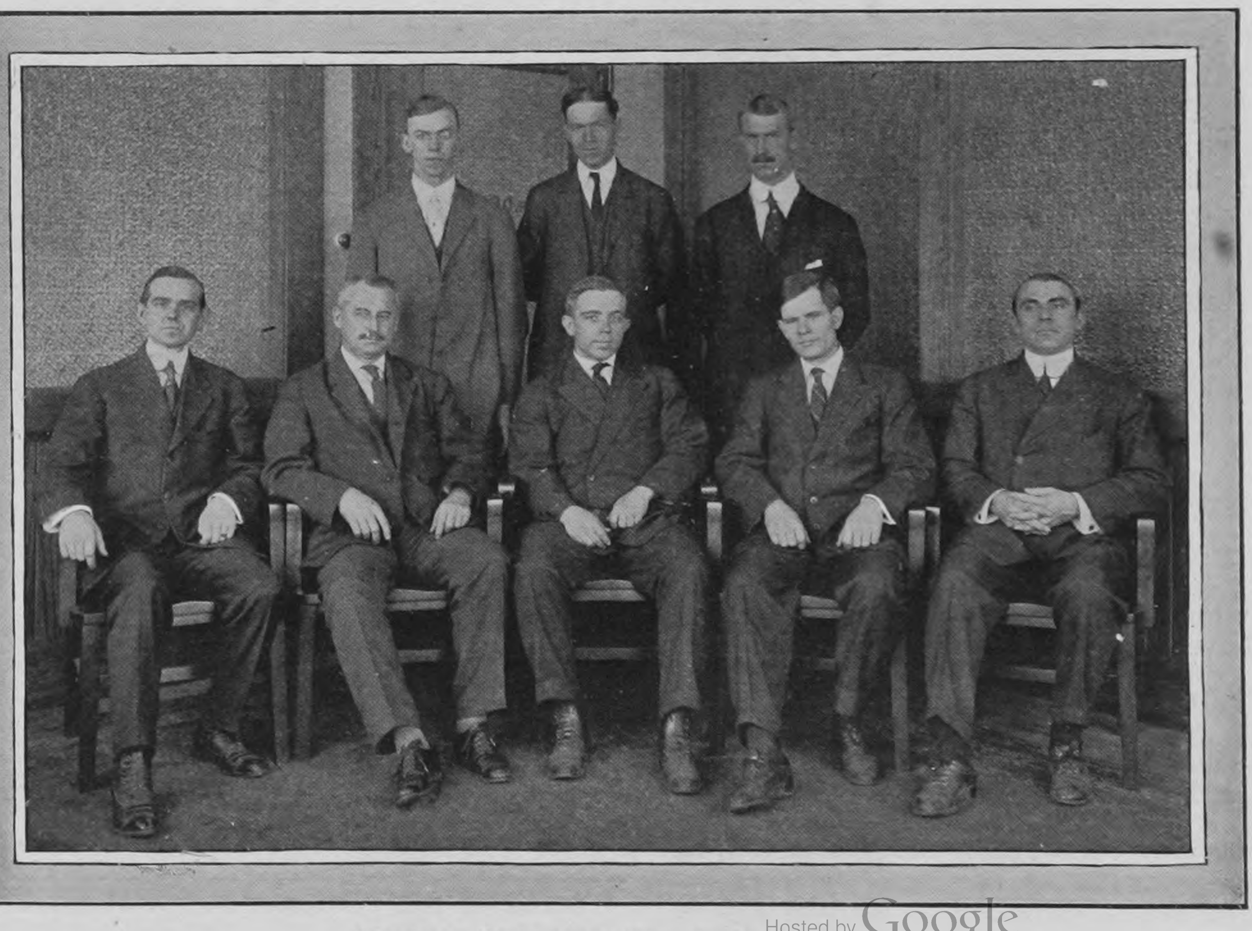
on he transferred his allegiance to the Ford Motor Co. Hupp studied the science of automobile building and made up his mind to start a factory. He associated himself with E. A. Nelson, then an employee of the Packard factory in the designing department. The two put their heads together and made up their minds to cast their all in the endeavor to interest capital and start a factory. This



The Hupp Motor Car Co.'s Plant.

oth men a salary if they would devote
eir whole time to designing and plan-
ng a car such as Hupp had in mind.
he car was completed in November, 1908.
mmediately, a company was incorporated
-the Hupp Motor Car Co. J. Walter
rake was elected president; R. C. Hupp,
ce-president and general manager; John
Baker, secretary, and J. R. Drake, treas-
rer. Factory room was secured on Bel-
vue avenue, and contracts were let for
aterial. In its first year the Hupmobile
made a remarkable record. The model was a success, 500 were sold, the company had built a fine, modern factory of U-shape, 350 feet deep and 131 feet wide, and contracts have been let for the material for 5,000 cars of the 1910 model.

Mr. Hupp's idea of a motor car was a genuine novelty. "A big car boiled down," is the way the experts in Detroit expressed it, and that is an apt description. It took a lot of calculating to get the specifications which Mr. Hupp wanted, into a half-size road locomotive, but that is just



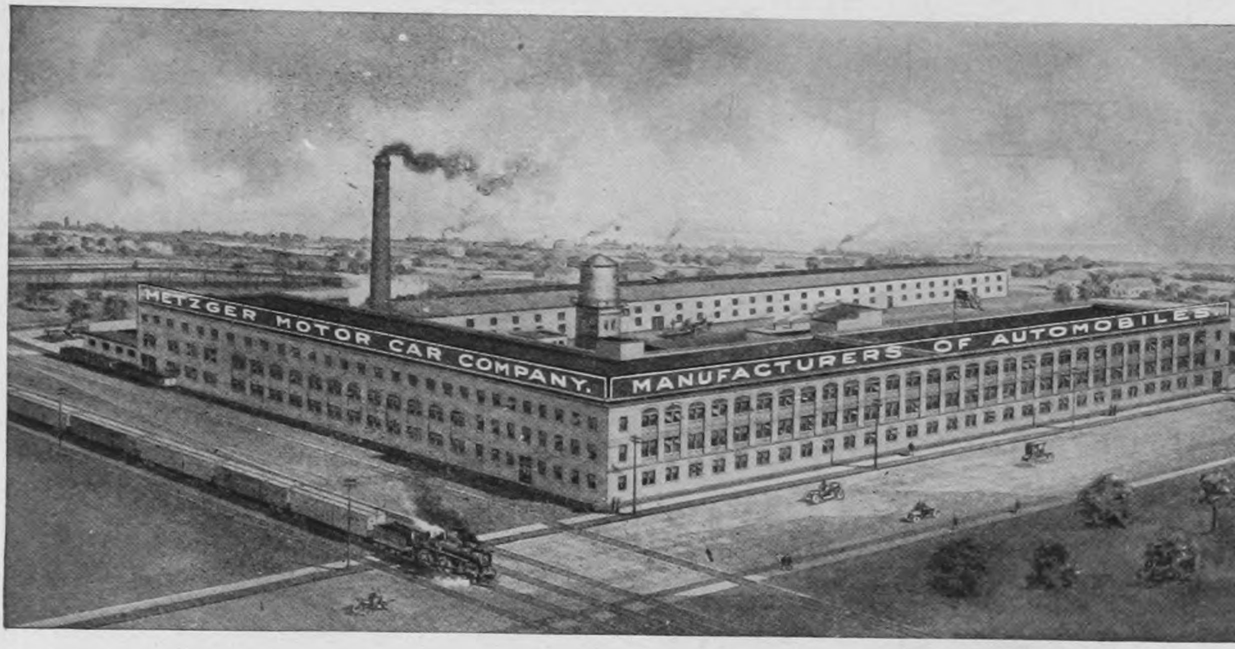
Department Heads, Hupp Motor Car Company.

all the other Detroit plants, is overwhelmed with orders for 1910, and is facing

factory space in which to accomplish task and a selling staff all organize assist in the performance.

Metzger Motor Car Company

FOR the third time in the history of the manufacturing industry, "Billy" Metzger has made the motoring world sit up and take notice. The first time he did it was in 1903, when he came back from the New York show with orders in his pocket for 2,100 single-cylinder Cadillacs. The second time was when he formed the Everitt-Metzger-Flanders combination, which gave to the world the E-M-F., now one of the most important factories in the city, though in operation but a year. His latest is the new Metzger Motor Car Co., organized a few months ago, and for which already a brilliant success seems assured.



Factory of the Metzger Motor Car Co.

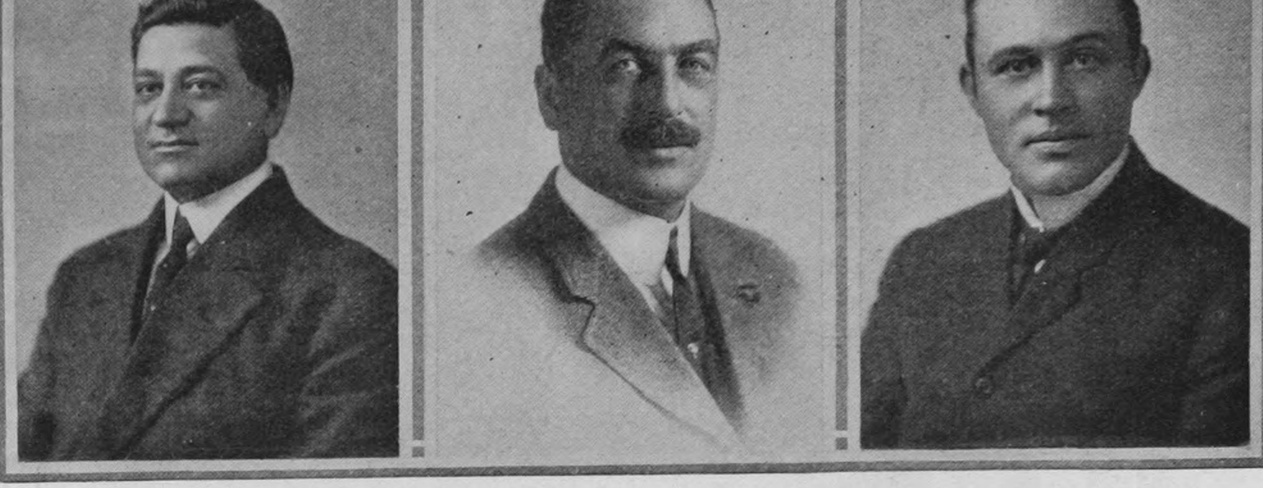
In his latest venture, Mr. Metzger is again associated with "Barney" Everitt and "Will" Kelly, both veterans in the manufacturing field, if, it may be said, to be old enough to contain a veteran. Mr. Everitt painted and finished the bodies for the Ford, Cadillac and E-M-F., for years when the manufacturing industry was in its infancy. He was connected with the Wayne and swung its consent to the deal from which the E-M-F. was

vantage, as yet, all the firm's outpu 2,500 cars for 1910 having already b sold. Later on, however, Everitt thr ens to catch up, if Metzger shows slightest symptom of resting on his o

Kelly was one of the pioneer gas- gine experimenters of Detroit. He wor with Henry Ford on his early models designed the successive models of Wayne and the E-M-F. of 1909. He c structed what was, in all probability, first planetary transmission ever asse bled, and now holds many patents. has designed the "Everitt Thirty," un which title the firm will market its p duct.

B. F. Everitt is president, William Kel vice-president, and William E. Metzg secretary and treasurer of the compa

The Metzger was more than fortuna in avoiding one difficulty which has b set most of the young factories in D troit. It was able to secure a commodic and well-built factory building at the ve start, the Meier Trunk Co. being duced to part with its fine plant on M waukee avenue, in time for the motor c manufacturers to get it equipped for th



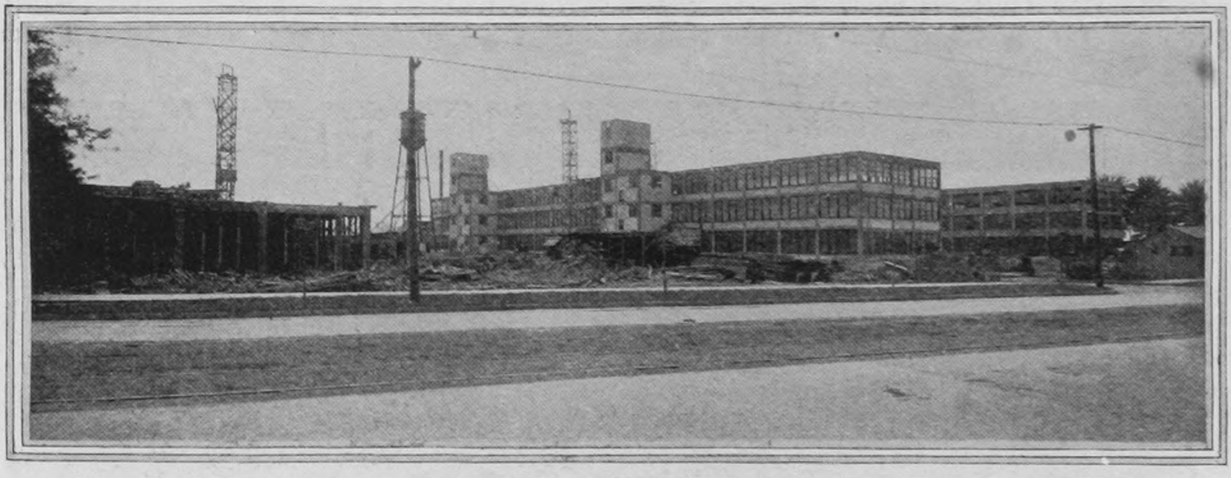
Officials of the Metzger Motor Car Co.

Reading from left to right; Wm. Kelley, Designer; Wm. E. Metzger, Secretary and Treasurer, and Bernard F. Everitt, General Manager.

its own car than is the usual rule. It will machine all its own nuts and bolts and will manufacture its own gears, as well as the parts which are usually included in the repertory of a motor car factory's duties.

The Chalmers-Detroit Motor Company

The Chalmers-Detroit Motor Co. owes its birth to the fact that four brilliant young automobile experts, thoroughly grounded in their different specialties, made up their minds that they might as well be making money for themselves as for their employers. It owes its continued existence and increasing prosperity to the abilities of these young men and their habit of sticking to their work.



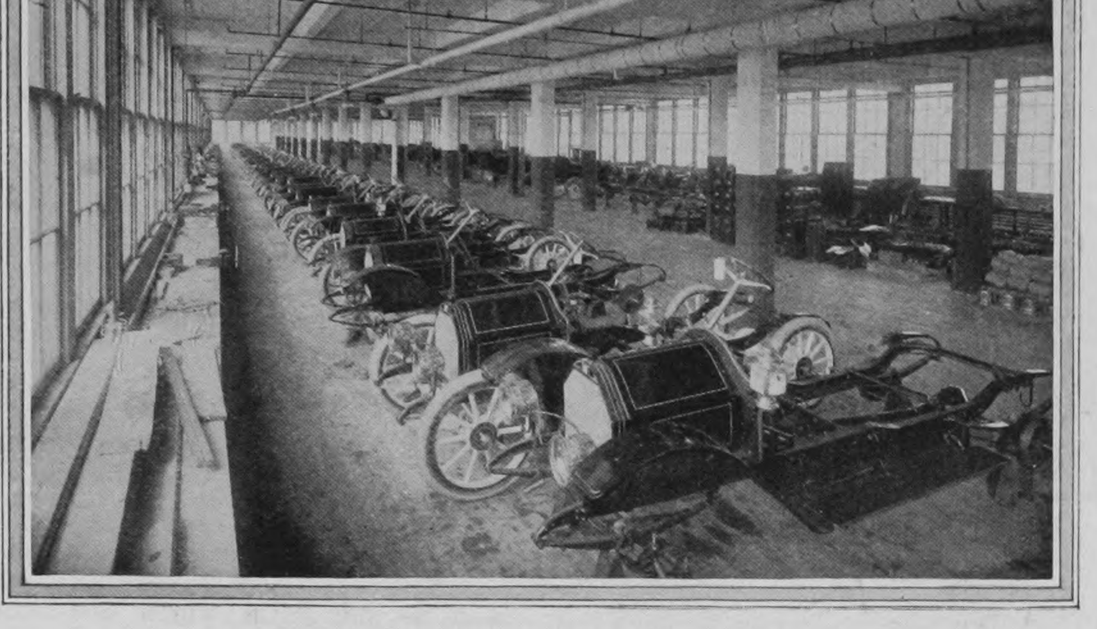
New Additions to Chalmers-Detroit Factory.

The above picture shows some of the additions now under way. To the extreme right is shown the old factory building, while in the center is the recently completed addition. To the far left is the first floor of a contemplated four-story duplicate of the other two main buildings. Additional floors are now being added to the original building as well as the completed new building.

In 1905 Howard E. Coffin, an experienced and successful automobile engineer and designer; Roy D. Chapin, a man who had learned the selling end of the industry in all its phases; James J. Brady, who had won his spurs in a position of responsi-

material purchaser, as skilled in his line as the others were in theirs, determined to manufacture automobiles in Detroit. They cast about for financial backing and secured it from Edwin Ross Thomas, o Buffalo, the leading spirit of the factory made famous by the Thomas Flyer. Articles of incorporation were filed, a factory building was secured on the East Side o Detroit and Mr. Coffin designed a car which met the ideas of his compatriots. Mr. Brady organized a factory staff. Messrs. Chapin and Bezner went to letting contracts and organizing a selling staff.

The Detroit-Thomas, as the car wa

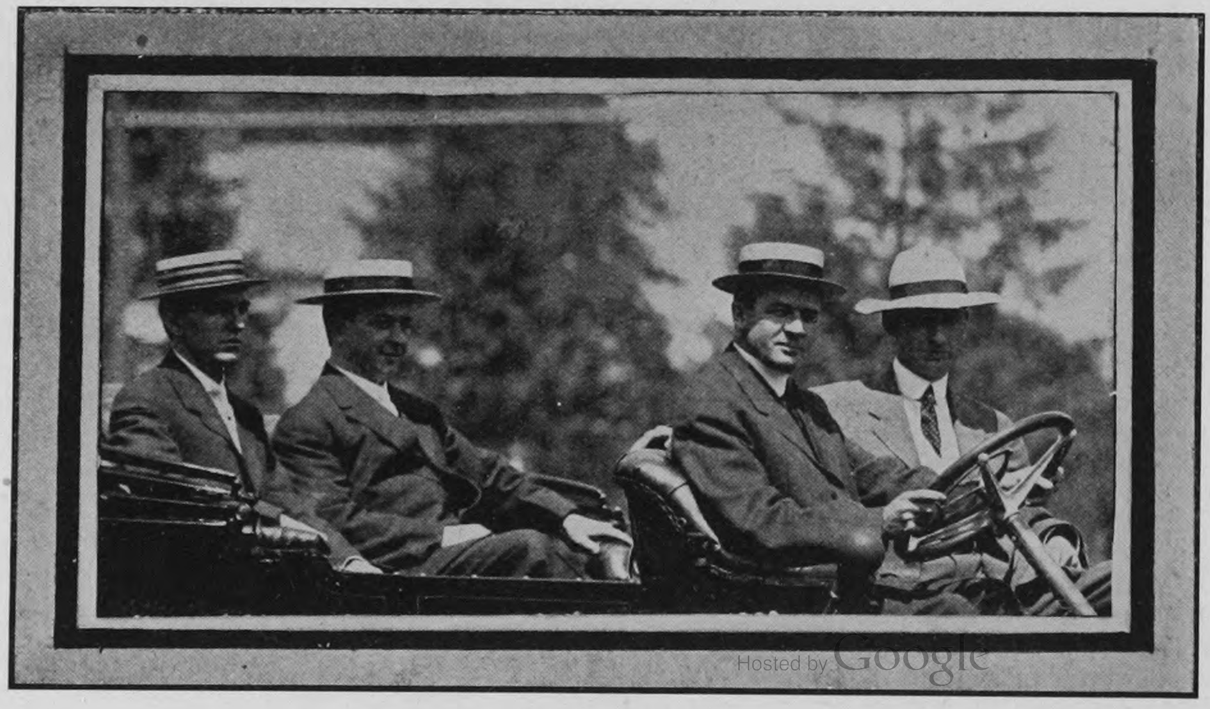


Second Floor Interior of the Chalmers-Detroit Motor Co.

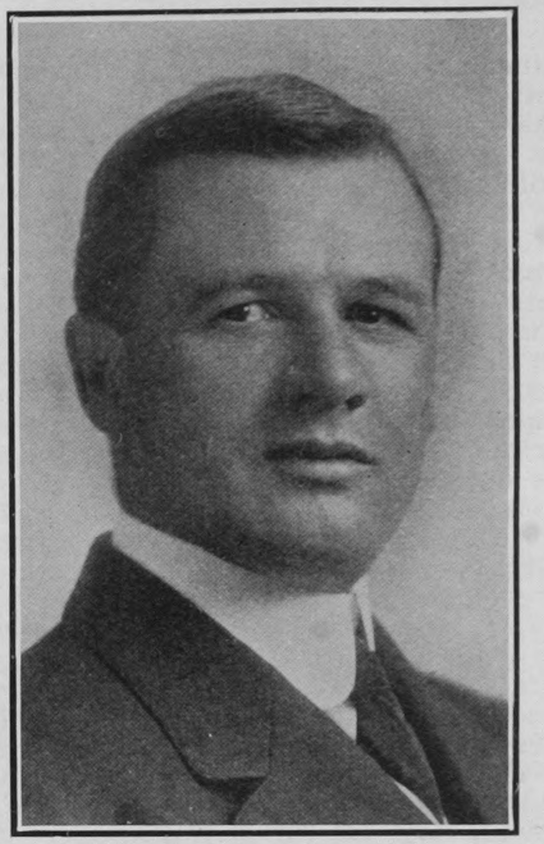
The entire second floor of the new building of the Chalmers-Detroit Motor Company is used for assembling finished cars. The above picture shows one section of the floor containing chassis waiting for bodies to be attached, and other final touches before being finally tested out and shipped.

the big shows. It was the forerunner of a big type. In some respects it was the first car of its kind for the value. It was by all odds the raciest-appearing vehicle that the trade had seen up to that time, outside the realm of the extremely expensive, and the cars sold like hot cakes. During 1906, 500 cars were built and marketed. The company constructed a fine cement and steel factory out on Jefferson avenue and moved into it. Construction work was so extensive that the company was unable to find time to increase its output very materiall during 1907 and 1908. The latter yea however, saw its biggest business stroke.

Persuaded that the automobile industr offered the best opening to a man desirin to quit a salaried position, Hugh Chalmers who had been for some years the manage of the immense factory of the Nationa Cash Register Co. at Dayton, looked th Detroit-Thomas factory over, and secure a controlling interest in its stock. He wa chosen president, succeeding Mr. Thomas



ame Chalmers-Detroits, under which title hey are known to the world of motoring ast, west, north and south.



Hugh Chalmers, President.

The first thing Mr. Chalmers did was to look over the situation carefully and work out a scheme of organization, according to he pyramid system. He drew it out on paper and posted a copy in a conspicuous place. At the top there was a pyramid labelled "Stockholders." From them the responsibility descended directly to the pyramid tagged "Directors." "President" was the next title, he being directly responsible to the directors. Here the system began branching out like a geneological tree. From the president ran two lines of responsibility—one to the manager of the selling pyramid, directly under his control, the other to the pyramid entitled "General Manager" to whom were responsible pyramids headed respectively, "Engineering," "Material," "Inspection," "Factory," "Finance," "Technical" and "Employment.'

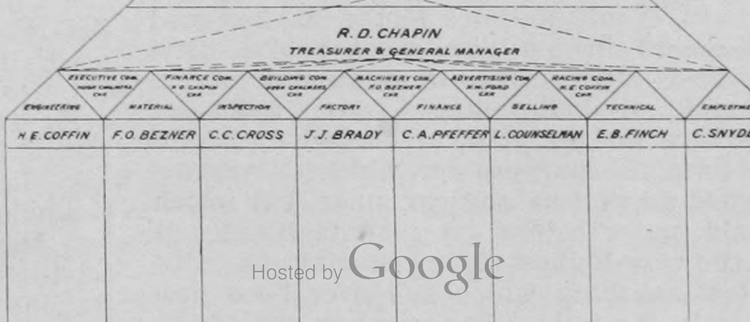
At the head of every pyramid was a man chosen to assume personally the responsibility. The whole thing was as carefully worked out as the organization

which money had been so easy to make under a hit-or-miss plan of operation that system had as yet failed to advance very far. Mr. Chalmers came from a factory which he had pyramided successfully and knew what he was doing. Eventually the whole factory caught his spirit. The heads of the pyramids began to pyramid the organizations under them. And the whole outfit began to turn out cars by the pyramid, too.

For 1909 the company announced an innovation which was nothing less than a four-cylinder car of ample size and the most advanced type of construction, lightly built and at a price that was virtually revolutionary. More than any other influence, in all probability, the Chalmers-Detroit 1909 model tended toward establishing the type which enjoyed such remarkable popularity during the past season. The company marketed 3,000 of these cars. It continued to manufacture the higher-powered car with which the company had won its first success, and built more of them than ever before.

The year 1909 plainly demonstrated tha the factory building which had seemed so enormous when it first reared its construction work on the surface of the broad plain near the Grosse Pointe race track was far inadequate to take care of the manufacture of the firm's output. To the one main building which had housed the plant in the main was added another, als 60 by 400 feet, but four, instead of thre stories in height. Before this addition ha been completed, a third of almost equa size was under way.

In 1910 the firm will build 4,500 of th "Thirties" and 1,000 of the "Forties." Th additional factory room is being used fo


STOCKHOLDERS
BOARD OF DIRECTORS
HUGH CHALMERS
PRESIDENT
R. D. CHAPIN
TREASURER & GENERAL MANAGER
EXECUTIVE COM. HUGH CHALMERS CHR
FINANCE COM. R.D. CHAPIN CHR
BUILDING COM. HUGH CHALMERS CHR
MACHINERY COM. F.O. BEZNER CHR
ADVERTISING COM.
RACING COM. H.E. COFFIN CHR
ENGINEERING
MATERIAL
INSPECTION
FACTORY
FINANCE
SELLING
TECHNICAL
EMPLOYM
H.E. COFFIN
F.O. BEZNER
C.C. CROSS
J.J. BRADY
C.A. PFEFFER
L. COUNSELMAN
E.B. FINCH
C. SNYD

the manufacture of parts which have hitherto, according to custom, been purchased of the parts manufacturers in Detroit and elsewhere.

The proximity of the factory to the Grosse Pointe race track, abandoned for the original purposes for which it was built, led to the leasing of the course for the use of the Chalmers-Detroit testers. The speed which the cars developed in the testing process showed Mr. Chalmers the advantage that should result, were this speed systematically exhibited in the various competitions on schedule, all over the country. After mature thought, he returned to the factory and inaugurated a new pyramid. "Contest" he termed it, and put a man in charge whose duties were to secure a staff of competent drivers and go after all the motoring prizes in sight. Contest Manager Bill went at it in earnest. A staff of drivers including Knipper, Dingley, Matson, Lorimer and others was organized and worked out at the track near the factory. Entries were made in every important contest and in many of lesser note. As a result, the Chalmers-Detroit has been in such affairs the most prominent car on the market. Matson won the Indiana trophy on the Cobe Cup course, the Massapequa Sweepstakes run over the Vanderbilt circuit and took second place in the 100 mile light stock car race at Atlanta, Ga., which was won by his teammate, Knipper. Knipper also took the Merrimac Valley Trophy and the National Light Car Stock Chassis race at the Lowell meet and many other minor competitions. Lorimer won more than 20 prizes with the "Forty" in track racing and hill climbs. Dingley won the classic Santa Monica road race at Los Angeles, the Wemme trophy in the Portland, Oregon, road race and many of the other competitions. Gene Bemb won the Detroit Trophy in the Glidden tour.

Chalmers-Detroits did pathfinding stunts galore. They carried press representatives on tour after tour. They won virtually 90 per cent. of the competitions in which they were entered, according to factory statistics.

FAIRVIEW MOTOR CO.

Immediately adjoining the big Chalmers-Detroit factory out Jefferson avenue, in what was formerly the village of Fairview, but is now a part of Detroit, there is building a factory which will be used by the Fairview Motor Co., the organization of which was announced during the summer from the offices of the Chalmers-Detroit. The organization is exactly the same as that of the Chalmers-Detroit, but the factory will be devoted, when completed, to the manufacture of commercial vehicles, including principally trucks and taxicabs. The factory organization and the ownership of the plant itself are entirely distinct from the Chalmers-Detroit, though the policy of one will naturally be patterned very closely on the other.

The details of what is expected from the Fairview Co.'s factory have not yet been given out. The Chalmers-Detroit has done some experimenting in the taxicab field in its home city with very favorable results. During the summer General Manager R. D. Chapin visited Europe and made a careful investigation of the methods in which taxicabs are run in the large European capitals and at rates of fare only a fraction of those in vogue at present in the United States.

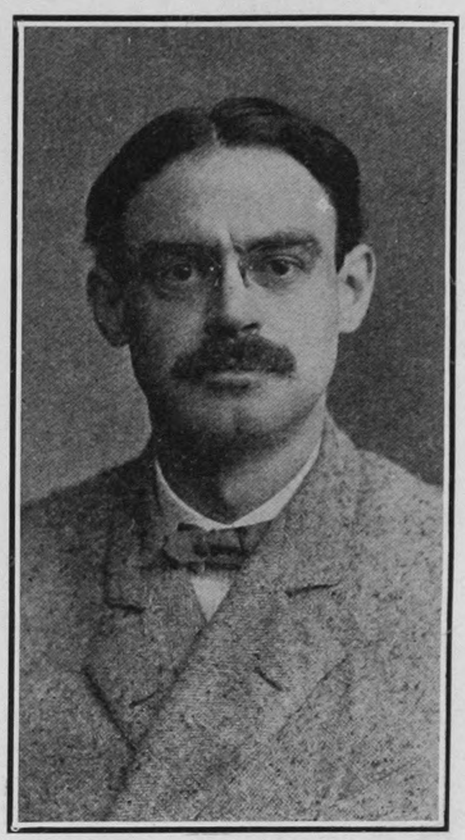
It would surprise only a few if the announcement of the Fairview Co., when made, would feature the firm's plans relative to the production of taxicabs in hitherto unheard-of numbers.

Brush Runabout Company

DURING the summer of 1906 Alanson P. Brush, known to the motor manufacturing world first as the man who designed the famous single-cylinder Cadillac and later as the chief engineer of the Buick Motor Co., designed in his own workshop a little single-cylinder car with a number of extremely original features. Mr. Brush set out to make his new car one which would perform the purpose for which it was designed as well as any car made, but which could nevertheless be manufactured out of the very highest-class material at a price below anything which had ever been possible in the past. The car was the Brush Runabout.

Frank Briscoe, president of the Briscoe Manufacturing Co., one of the largest makers of automobile parts in Detroit, heard of Mr. Brush's car and took a look at it. He was so taken with the design that he secured Mr. Brush's consent to take the work of manufacturing from the model.

Mr. Briscoe's plant was so busy furnishing radiators and other equipment to the other Detroit factories that year, that but little progress was made on the runabout, aside from the installation of the special machinery required for its production. In 1907 the firm put 100 of the little runabouts through the factory. In 1908 the demand had been firmly established and 700 were produced. This leaped to 2,000 in 1909. On January 1, 1910, the Brush Runabout Co. hopes to be able to move the center of its endeavors from the Briscoe factory on Woodward avenue to its new plant on Oakland avenue, in the northern part of cars during the year.



Frank Briscoe.

he new factory of the Brush Runabout represents many radical ideas in ar- gement. Each department of the manu- ure, instead of being housed under one , is separate. The machine shop, 150 485, is the largest. Then there is a tion of each are the office, the experimental shop, the brass and aluminum foundry, the shops for testing, case-hardening, enameling and blacksmithing. All the buildings are one story in height and the novel arrangement is certain to please the eye and attract the interest of the manufacturing expert.

The remarkable deeds of the little Brush have been among the motoring sensations of the past season. It has been and will remain, so long as Mr. Briscoe is the genius at the head of the factory, the firm's policy to demonstrate the quality of its output in all competitions to which it is eligible. Two Brush cars made the circuit of the Glidden tour last year and were right there at the finish. One has climbed Pike's Peak and, not content with this achievement, kept right on up the steps of the Summit House, gaining thus the fame of the greatest elevation ever attained by motor car. Its little single cylinder engine and, in fact, its whole design feature simplicity and strength throughout. The proudest boast of its manufacturers is that, instead of being a big car, boiled down, it is an original little vehicle, designed particularly for the purpose which it is filing in the world of rapid transit.

While Mr. Briscoe is the big man behind the gun at the Brush factory, and performs the duties of president and general manager as well, he has two efficient aides who have been with the company since its inception. These are Vice-President John A. Boyle and Secretary-Treasurer Emil D. Moesta.

The E-M-F Company

ON the evening of June 2, 1908, in a cafe in New York City, frequented by the motoring public, three young Detroiters met and formed a compact destined to result in one of the largest manufacturing concerns in the United States, within the t space of but a little more than a r's time. The men were Bernard Ever- a young manufacturer of automobile ies, who had also been allied with the yne Automobile Co.; Wiliam E. Metz- who had been sales manager of the illac and had conducted the first retail omobile establishment in Detroit; and lter E. Flanders, then factory manager he Ford Motor Co., which had just as- nded the world by putting on the mar- within a year the record-breaking num- might be done. Everitt believed that he could secure the Wayne factory building and the support of the wealthy men behind the old firm, to as great an amount as would be necessary to start production. Metzger said that selling cars was where he lived. Flanders knew that, if anybody could get the cars through the factory on schedule, he was the man.

The three went back to Detroit and to work. Everitt succeeded in swinging his part of the deal, securing not only the Wayne, but also the Northern factory in Detroit and the annex of that concern at Port Huron. Each of the three put in $35,000 of his own money. The car was christened the "Everitt-Metzger-Flanders" which a time-saving public speedily abbreviated to "E-M-F." E. LeRoy Pelletier, who had

F. Cars were in actual use and the public was calling for more. The $35,000, which each of the original three had put into the plant, had turned itself over so rapidly that

E-M-F. Factory, Piquette Ave.

Messrs. Everitt and Metzger found themselves confronted with an offer of more than three-fold for their share in the concern. In company with Engineer Kelly, who was also an original investor in the firm's stock, they decided to sell and the stock which they held

Walter E. Flanders, Pres. and Gen. Mgr.

went to Fred S. Fish and Clement Studebaker, both identified with the Studebaker Wagon Co. of South Bend, Ind. With this

Studebaker E-M-F. Factory, Clark Ave. & Jefferson Ave.

persuaded the E-M-F. directors to sell them the entire output of the factory.

If the growth of the E-M-F. was markable up to this time it has been si ply stupendous since then. The firm sta ed on a campaign of expansion which ha made it the largest employer of labor the city of Detroit. It first doubled and the trebled its original factory on Piquett avenue and is now building a couple mor enormous additions to its floor space. purchased the plant of the DeLuxe Moto Car Co. in the western part of the cit and turned it over to a superintendent wh was provided with the working model a lighter car, with orders to make 25,00 of them during the next fiscal year. Its ow original output was raised from 8,000 t 15,200 for 1910.

It purchased the plant of the Sanitar Steel Stamping Co., on Franklin street, tha had been making bath tubs, and installe the machinery of an up-to-date steel stamp ing factory for motor cars, the main fea ure in the equipment of which is a pres of 2,500 tons power. It purchased the Aut Crank Shaft Co. that had been makin shafts for a considerable number of th Michigan manufacturers, and set it to wor on E-M-F shafts alone. It bought out th Monroe Body factory at Pontiac and keep it working merrily, turning out the bodie for E-M-F. cars. It purchased a large trac of land adjacent to the old DeLuxe plan and built a brass foundry and an iro works. The old Port Huron factory of the Northern it still has in active operation There is located the source of the E-M.F rear axles and bevel gears. It bought a abandoned factory across the river i Walkerville, Ont., and is now equipping that for the manufacture of E-M-F. cars and Studebaker Flanders runabouts for the Canadian trade, with a very live chance o making a campaign in the other British possessions, as well as the old country it self, to all of which the output of the Canadian factory will be admitted virtu

Officers of the E-M-F. Company.
Reading from left to right: E. Leroy Pelletier Advertising Mgr.; Walter E. Flanders, Pres. and General Mgr.; General Superintendent Wallering; Factory Manager Walburn, and Chief Engineer Heaslet.

on the stockholders. It must also be membered that the $360,000 which chang- hands when Messrs. Everitt, Metzger d Kelly disposed of their holdings, went these gentlemen and not to the E-M-F.

Beyond question the success of the E-M- plant is the most meteoric in the his- y of a meteoric industry.

The big man of the combination has vays been Mr. Flanders. The others did eir parts well, but the feat of a man who arted a campaign without even a factory d closed it with 8,000 of his output suc- ssfully in use must stand as virtually equalled in the history of the industry. e has made the E-M-F. factory the most veted spot for automobile labor in the y of Detroit. The whole factory works a bonus system. During the season of 10, Mr. Flanders has set the normal ca- city of his plant at 1,000 cars monthly. r every car over this thousand that is ade, every employe of the factory will ceive an addition to his wages, clear wn to the office boys and stenographers.

Each day's work is tabulated and posted the following morning. If the result is favorable—and it almost invariably is—there is general rejoicing. If the output has fallen below that of the day before, there is general inquiry and, in five minutes every employe of the factory knows what occasioned the delay and in what department it occurred. During the world's baseball series, four games of which were played in Detroit, Mr. Flanders declared that, if the output of the factory reached 50 cars per day, half-holidays would prevail for all hands. Nobody quit work until the fiftieth car came through and was trundled on the siding to wait for the freight train to come along. And all of the employes who cared to, saw that ball game.

He is a big man, is Mr. Flanders. He weighs around 275 pounds and is built to carry it all gracefully, too. But he is a man for whom 10,000 men will work this year and a man under whose orders more than 40,000 automobiles are going to be built. He's got a 275-pound job.

Seitz Automobile & Transmission Company

One of the younger firms manufacturing otor cars in Detroit is the Seitz Auto- obile and Transmission Co., which, as ight be inferred, not only builds motor

tion of William J. Seitz, the engineer, whose ideas are expressed in the firm's output. The Seitz began manufacturing in 1908, and built several trucks which shown at the Detroit show in 1909, and made a very favorable impression. The transmission, which is Mr. Sietz's especial pride, is of the double friction order, and, while exceedingly simple, is nevertheless most effective for the purpose to which it has been put.

A feature of the Seitz success has been the facility with which its cars have been run by men who were formerly teamsters in the employ of the companies purchasing the cars.

The company has been kept busy during 1909, and expects to branch out more materially in the season that is soon to open.

Mr. Seitz is the president of the company. The other officers are as follows: Vice-president, Daniel Hasley; secretary, William Weilnau; treasurer, Herman Woelmer; general manager, Silas A. Kring.

The firm's factory is located at 225-229 Beecher avenue.

Anderson Carriage Company

FOR more than twenty years the Anderson Carriage Co. was one of Detroit's leading manufacturing plants. Founded in 1884 by the man whose name it bears, it won for itself a reputation of national scope. During that time it manufactured a total of 160,000 carriages of various designs. Its business during the early nineties reached a climax of 16,000 carriages a year.

Then came the automobile. Mr. Anderson and his associates felt the pulse of the carriage trade begin to flutter. They saw the new industry advancing by leaps and bounds. To a great extent it was making inroads on their own. Then it was that the firm decided on one of the most radical steps possible. Instead of curtailing its output or striving to stimulate a business that was showing signs of decadence, it dropped the manufacture of carriages altogether, threw away most of its machinery, discharged most of its employes and reorganized its plant to make automobiles exclusively.

As a result the Anderson Carriage Co. is to-day a larger and wealthier concern than ever before. Its Detroit Electric is seen on the streets of every great city in the country and its plucky directors are reaping the fruits of their game decision.

When President W. C. Anderson, Vice-President C. A. Newcomb, Treasurer William Locke and Secretary W. P. McFarlane, who were and still are the Anderson Carriage Co. decided on this radical change of plans, they deliberated long over the choice of type of car which the company should produce. It was agreed that the field was pretty well filled with manufacturers of gasoline cars and the electric seemed to offer the best opportunity. There had never been an electric built in Detroit, but their whole policy was revolutionary, so this did not weigh greatly on their minds. They went into the market and secured the best electric vehicle man that it seemed to afford. With George M. Bacon as engineer and expert, a car was designed and tested out. The company ordered Mr. Bacon to give especial attention to building a car which would surpass any previous record in the distance it would cover on one charge. Mr. Bacon's product, in a drive over very average roads, tested out, showed a total of 140 miles.

This was amply satisfactory and, as soon as the new machinery was installed, the plant was set to work with its new machinery and its new staff. The first car was accepted in June, 1907. That year 125 more were built and delivered to the selling agencies which had been established. The cars were successful. In 1908 the Anderson Carriage Co. turned out 400 more. The season just closed saw 650 Detroit Electrics rolled out of the factory to the shipping platform. In 1910 the greatly enlarged factory will produce 1,500 cars, of nine models.

One gerat difficulty was experienced at the Anderson Carriage Co. from the start. This was the securing of a motor suited to the especial needs of a moving vehicle. Success was not attained until the company succeeded in making a big contract with the Elwell Parker Electric Co., of Cleveland, for the manufacture of just such a motor as was needed for the car. When the success of the enterprise became assured, the Anderson Carriage Co. purchased the Cleveland factory outright. Now virtually all of their car, but the tires and the wheels is made in the combined plants of the concern in Cleveland and Detroit.

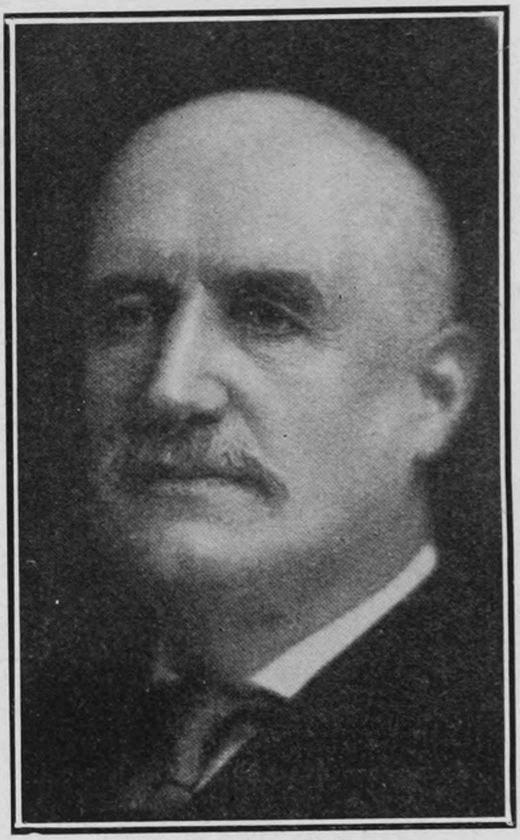
More, in all probability, than any of its rivals in the field of electric car manufacture, the Anderson Carriage Co. has gone in for strenuous tests of the ability of its output. Though the cars are intended, of course, for use on city pavements, the firm has never been loath to take its model out on the roads of Michigan and other states. Perhaps the crowning achievement of the Detroit Electric was its work in the Munsey tour, in which, though not eligible to entrance, it was permitted to make the trip under the watch of a skilled observer, who turned in a certification of its having a perfect score at the end. Through the event the Detroit had maintained an average speed of 14.5 miles per hour over roads of all sorts, and had made each control strictly on time.

e's local life is the continued search of s testers for bad pavements. Unlike their ethren of the gasoline car, the testers the electrics seek poor roads instead of e asphalt and the glossy macadam. To oroughly make certain that all the wirg is in place and securely fastened, it is e practice of the testers to search out e roughest possible street and they drive

The plant of the Anderson Carriage Co. is situated directly across from the station at Milwaukee Junction, on the East Side of Detroit, and commands ideal shipping facilities on the Michigan Central, Lake Shore and Grand Trunk, as well as being situated right in the center of one of the most populous laboring districts of the city.

Hudson Motor Car Company

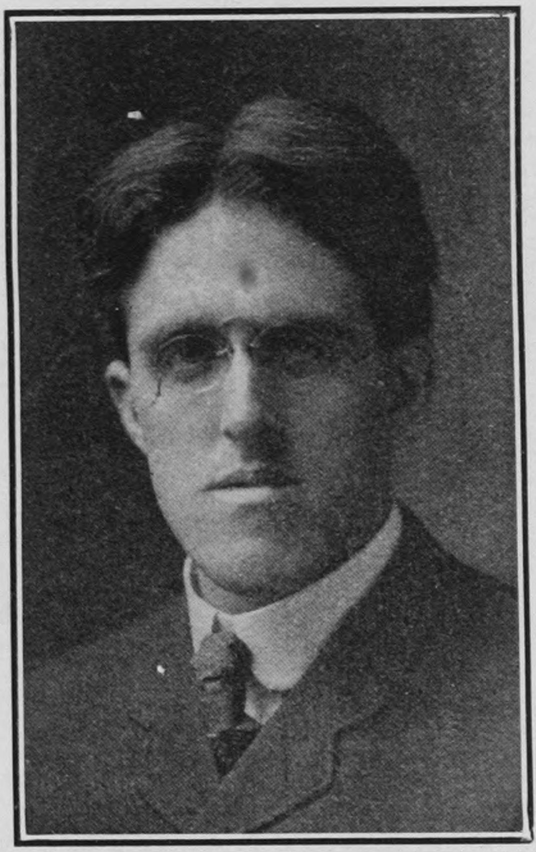
More than the usual trade ripple which ustomarily greets the announcement of e formation of a new automobile manfacturing firm, was noted in Detroit hen the first announcement of the Hudon Motor Car Co. was given to the press



J. L. Hudson.

n June, 1909. This was largely due to he fact that the firm was composed of nen who had already made marked sucesses in their respective lines of effort. . L. Hudson is the owner of the largest epartment store in Detroit and is a merhant of national reputation, as well as a oted civic leader in his home city. He s the president of the company and the nan from whom the car takes its name. The other officers are, with one exception,

“Thirty.” Hugh Chalmers is the Hudson vice-president; R. B. Jackson is treasurer and general manager; F. O. Bezner is secretary, and H. E. Coffin and R. D. Chapin are members of the board of directors. The large interest of the directors in the Chalmers-Detroit Co. does not in the least indicate any actual connection between the factory organizations. As a matter of fact, the two are completely separate. Not even in the purchasing departments is there any placing of combination orders, while the selling agencies are almost invariably at different locations in the various cities where both are handled. The cars fill an entirely different place in the motoring world, the Hudson being a 20-



Geo. W. Dunham, Designer.

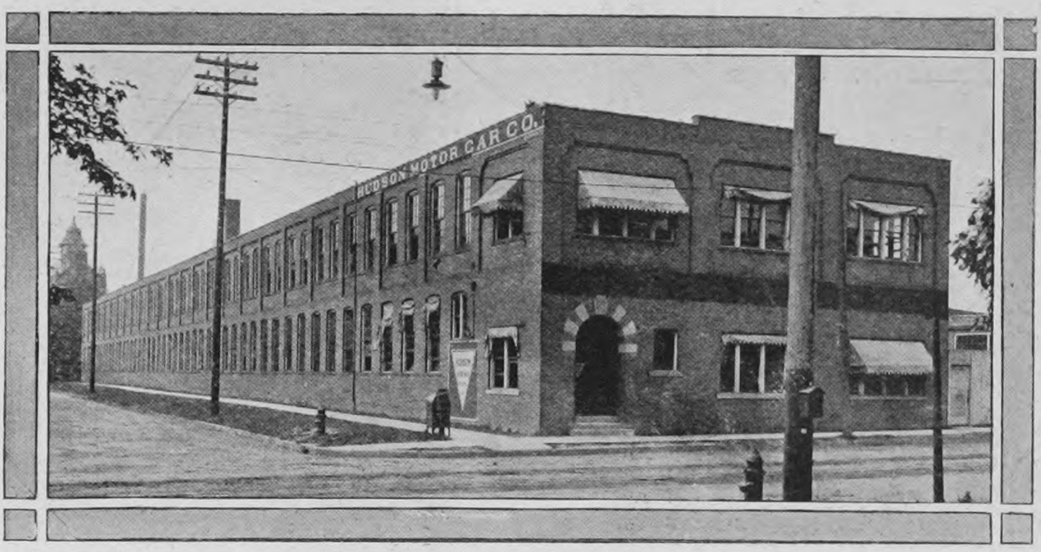
the chief engineer in 1907, when Mr. C
fin left the Olds to enter the Thomas-
troit. He resigned his position in Ma
1909, to complete the work which he
had in process for two years. The w
blossomed out as the Hudson Twenty.

The formation of the new organizat
was followed by the leasing of the
Aerocar plant on Mack avenue, but qu
ters there are regarded by the compa
as merely temporary and it is only a m
ter of time when the factory will ma
the announcement of a changed locati

The company started work on its 1
model in July, 1909, and was busily
work in a surprisingly short time. H
sons have been shipped to all parts
the United States in the six months
their initial year and have scored a p
nounced success. Consistency in runni
is said to be one of the chief assets
the car.

The company will finish its run of 1
models in July and will then have ma
ufactured 5,000 of them if the well-foun
ed plans of the management are met. T
entire output has been sold some ti
since.

R. B. Jackson, Treasurer and General Manager of the Hudson Motor Car Company.



Plant of the Hudson Motor Car Co.

Grabowski Power Wagon Company

"We guarantee Service," is the proud motto of the Grabowski Power Wagon Co., of Detroit, and the fact that the firm's product is in use in the work of many of the city's large mercantile establishments and that the firm's factory is now

While other engineers were at work d
signing touring cars and runabouts in t
early history of the motor manufacturi
industry, Max Grabowski was working
a power wagon. He built one in the ear
nineties. He kept adding improvemen

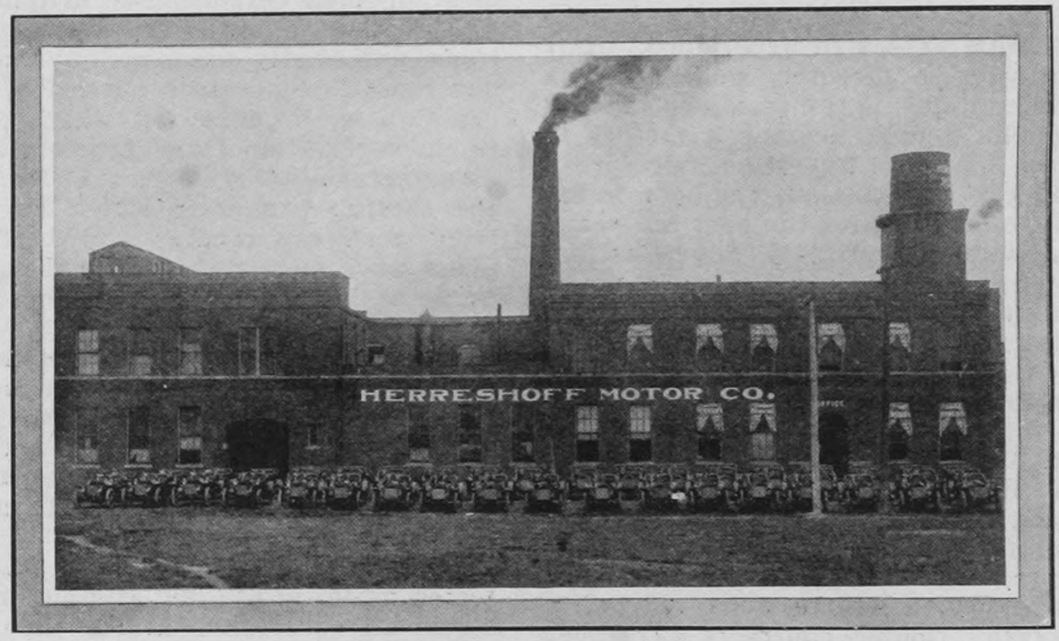
operated.

In August, 1907, Mr. Grabowski resigned his position with the Rapid and returned to Detroit, where, after incorporating his latest ideas in a model truck, he organized the company that now bears his name. Associated with him in the firm are Ber-

The Grabowski factory on Champ street has been outgrown in the seco year of the factory's history and nego ations are now in progress for the pu chase of a plot of land on which the fi will erect a factory with a capacity 1,200 trucks annually.

The Herreshoff Motor Company

The Herreshoff Motor Company was organized in September, 1908, to build automobiles and immediately began operations at its present location on Harper Avenue and Dequindre Street, Detroit, Mich.



Herreshoff Motor Company Plant.

Charles F. Herreshoff, who is well known as an engineer and naval architect is now president and acting head of the concern.

The chief aim of this company is the production of a small, high class automobile of the best quality, intended for those who appreciate beauty and refinement in design rather than greater size with crudeness. The output is limited, the watchword being "Quality rather than quantity

When the factory is in full operati about 100 men are empoyed in the var ous departments, but much of the work making up the component parts is do outside of the plant by parts specialis who work to designs furnished by the He reshoff Motor Company.

The 1910 product now coming throu the factory will be distributed direct agents instead of through an outside se ing agency as was done with the 19 production, this plan being adopted as b ing more satisfactory to the customer.

The Krit Motor Car Company

Among the newcomers and builders of medium priced high grade machines, are The Krit Motor Car Company. This concern was organized September 3, 1909. Mr. C. S. Briggs, President; Wm. S. Piggins, vice-president, and B. C. Laughlin, secretary and treas. The car is of runabout type, although arrangements are made for seating four passengers. It is a natty looking little machine and was designed by first car was placed on the road Octob 30th, and has been thoroughly tried ou Deliveries are now being made and it expected that 1,000 machines will be co pleted before the end of the season; par having been secured for this output.

The car has a 96-inch wheel base, a extremely compact four cylinder mot cylinders cast "en bloc," bore, 3¾ inche stroke, 4 inches, sliding gear transmissi

Warren Motor Car Company

The Warren Motor Car Co., of Detroit, one of the latest additions to Detroit's automobile companies, capital stock $100,000, all of which has been subscribed and paid in, is now in its new plant, corner of Isabella and Michigan avenues, Detroit. The car is to be called the Warren-Detroit, is of 4-cylinder "en-bloc" type and will sell at $1,100 f. o. b. Detroit.

Homer Warren, Postmaster of Detroit, who heads the organization, is known from one end of the country to the other by reason of his prominence in Detroit's real estate and manufacturing affairs. Mr. Warren is a business man of the aggressive type, who does things. With him is associated C. Haynes Wilson, of the Wilson Body Co., who, while not active in the affairs of the company, will give it the benefit of his extensive experience. Harry M. Snyder, a director, well-known in automobile circles, is the man who induced the Michelin people to open a factory in America; John G. Bayerline, vice-president and general manager, has been in the automobile business for the past ten years. He was with the original Pope-Hartford Co.; later with the Olds Motor Works in the Engineering Department, and for three years was purchasing agent. When the Hudson Motor Car Co. was organized, he took charge of their purchasing department. R. W. Allen, secretary, was with the Olds Motor Works for six years; later with the Hudson Motor Car Co.

The list of stock holders also shows a number of well-known motor parts manufacturers. The company will build 500 cars, all of which will be delivered before July 1, 1910. Double contracts have been made for all parts and deliveries guaranteed under penalty.

Detroit-Dearborn Motor Car Company

The Detroit-Dearborn Motor Car Company was organized in Detroit, Michigan, this past summer to build medium touring cars and runabouts. The first cars were on the road November 15. The price which is not definitely settled as yet will be somewhere between $1,400 and $1,800.

The president of the company is Mr. Edward Bland, vice-president, Mr. Arthur E. Kiefer; treasurer, Mr. Samuel D. Lapham. They have secured a lease on a building in the village of Dearborn located four miles from the Detroit city limits out Michigan avenue and have acquired 71 building lots in the heart of that village on which erection of a factory will shortly be started. The company is incorporated under the laws of the state of Michigan for $50,000 and no allowances in the incorporation has been made for patents, tools, designs, or specifications.

The Cartercar Company

The Cartercar Co. is one of the automobile concerns which decided to move beyond the limits of the City of Detroit a short time ago. The factory is now located twenty-five miles out Woodward avenue, in the outskirts of Pontiac. There are four separate buildings of the factory, all of which are connected affording over five acres of floor space for the manufacture of automobiles.

The officers of the company are Frank T. Caughey, president; A. G. North, vice-president; Harry R. Radford, secretary; H. G. Hamilton, treasurer; R. A. Palmer, general manager.

Demotcar Company

More than a year ago a coterie of men, most of them experienced manufacturers and well familiar with the automobile trade, informally organized a firm which has recently blossomed out as the Demotcar Co., an organization which promises to cut a very important figure in the local manufacturing field, in view of its backing, the careful manner in which its development work was handled, and the fact that plans have been definitely laid to market no less than 3,000 cars during the season of 1909.

The men back of the Demotcar are C. H. Ritter, a wealthy retired business man who is president; George Anthony of the American Radiator Co., vice president; Frank T. Lodge, a prominent local attorney who is treasurer, and William Elsey, the man chosen secretary.

The Demotcar Co. had a thoroughly tested model in use and $100,000 in captial stock, all subscribed, at the time its formal announcement was made to the trade early in the fall. Factory Manager George T. Homeier and Chief Engineer Guy Hamilton, both men with prior experience in automobile manufacturing, were then in charge of the installation of the machinery in the new plant. The first models of the regular season's output are now coming through the factory.

The Demotcar—the name is an abbreviation of the "Detroit Motor Car"—is a light, two-passenger runabout which is noticeably different from any other factory's output

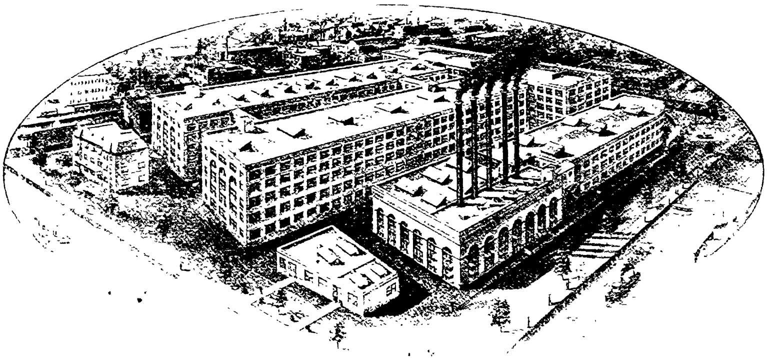
The Demotcar Co. has already arranged its sales department under a separate head in an office down town and is at present engaged in transferring the scene of its manufacturing activities from the outgrown structure which it has occupied during the last few months on Twenty-first Street, to the plant formerly occupied by the Sun Stove Co., at 1305 Bellevue Avenue, near one of the centers of motor car manufacturing. The new plant contains 40,000 feet of floor space and will permit the company greatly improved facilities for handling the work of production.

The Accessory Makers of Detroit

Morgan & Wright

IN the words of The Michigan Manufacturer, new factory construction, involving the latest ideas of best builders, must always possess a certain interest for progressive manufacturers. The Morgan & Wright plant, in Detroit, is not only among the newest among great Michigan plants,

The different Morgan & Wright buildings occupy seven acres, having a frontage on the Detroit River of 420 feet. The company is provided with almost perfect wharf facilities and, aside from this, a spur from the Detroit manufacturers' railroad enters the plant. In the arrangement of the different buildings the officers of the company aimed to accomplish the greatest economy of power distribution and the greatest convenience in handling the stock in process of manufacture.



The Morgan & Wright Plant.

There are six separate buildings devoted to manufacturing and subsidiary purposes, while a seventh structure is a handsome three story office building. The two largest buildings in the plant are five stories high with ground dimensions 60 x 300 feet. There is also a warehouse three stories in height with ground dimensions 60 x 250 feet. This structure is divided, one-half being given over to the finished product and the other to the raw material. A machine shop, 60 x 150 feet and three stories high is located between a power building and the warehouse, while between the power building and the river is a small one story structure for rubber cement.

The Morgan & Wright business is the manufacturing of automobile tires and inner tubes, rubber hoof pads for horses, rubber gaskets, flanges, connections, elbows, washers, valve-seats and numerous other articles of the plumbers' craft are made and each moulded in a different manner in this great factory.

Then there are solid rubber and cushion tires for carriages omnibuses and trucks, rubber heels, small rubber bumpers for automobiles, rubber hose, electricians' tape, and other articles almost too numerous to mention.

An account of the list of Morgan & Wright products would hardly be complete unless mention was made of the "White Seal" branch packings which are made in large quantities.

The Morgan & Wright Co. was incorporated in 1905 with a capital stock of $1,800,000. The officers are: president, C. J. Butler; vice president, A. L. Philp; secretary, J. C. Weston; treasurer, N. R. Feltes.

vanizing and Sheet Metal Works, vhich was founded by Benjamin Briscoe, he present president of the Maxwell-Brisoe Motor Car Co.

In 1900 the old company was reorganzed and incorporated under the present ame. In 1902 the manufacture of automoile parts was begun, the first piece being radiator for the Olds Motor Works. This was the beginning of a general sheet netal parts business, and within a short ime the entire plant was devoted to his line of work. The radiator which was nade for the Olds people was claimed to e the first successful one made in the Jnited States.

The line which the company now manuactures includes radiators, hoods, fenders, anks, tool boxes, drip pans, mufflers, and, n fact, all sheet metal parts.

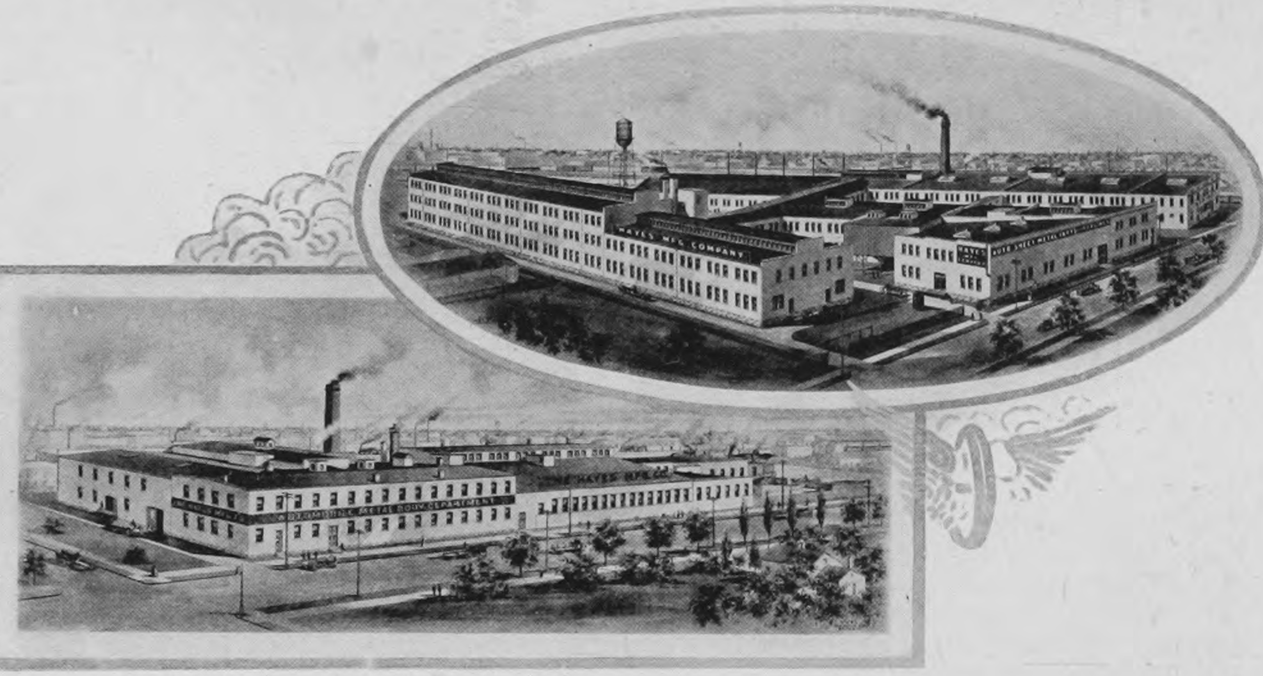
year, making it the largest manufacturer of sheet metal parts in the automobile industry.

It is claimed to be the only concern manufacturing all the different types of radiators, and this is undoubtedly one of the reasons why it numbers among its customers the oldest and largest manufacturers of automobiles.

The business has grown steadily and the demand for Briscoe products has increased so rapidly that it has been decided to build another addition to the Detroit factory, which will increase the capacity at least, 40 per cent. Work on this new addition will be begun in the near future.

The present officers of the Briscoe Mfg. Co., are: president, Frank Briscoe, vice president, W. C. Conant; treasurer, J. A. Briscoe; general manager, J. A. Boyle; secretary, E. D. Moessner.

Hayes Manufacturing Company



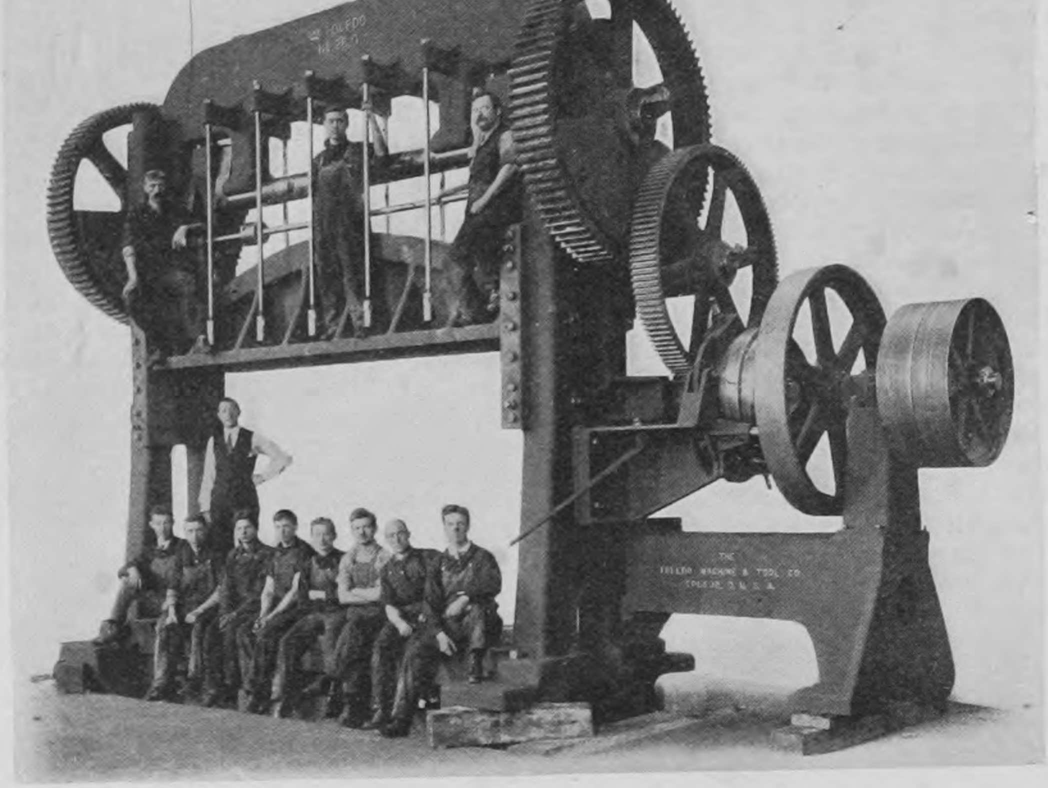
The Hays Mfg. Company's Plants.

The lower view is the Metal Body plant. The other plant is located at Mayberry and Grand Avenue.

The business of the Hayes Mfg. Co., nanufacturers of automobile sheet metal arts and forgings, originated in Clevend, O., in 1903, under the name of the Vilson & Hayes Mfg. Co. Finding that he greater part of the company's output vas being consumed in Detroit it was leemed advisable to move to the "Autonobile City." The company made this nove in November, 1903. About twelve

majority are still connected with the company, and include, aside from Mr. Hayes, Bert E. Thompson, factory manager, and R. F. Schiedel, superintendent.

Shortly after locating in Detroit, Mr. Wilson retired from the company. The name was then changed to the Hayes Manufacturing Co., H. Jay Hayes becoming president; E. F. Schultz, vice-president, and H. P. Carrow, secretary and treasurer.



Stamping Press Used by the Hayes Mfg. Co. Weighs over 100 tons.

Mr. Hayes and Mr. Carrow are actively connected with the concern, the former as general manager, and the latter having charge of the purchases and finances.

The business of the company has increased very rapidly. It doubled every year up to the present and this year's output will be as large as the combined outputs of the previous six years. The company owns and operates two new and up-to-date plants. The main factory and offices occupy over two acres of ground at Maybury Grand avenue and the Grand Trunk Railroad. In this plant 700 men are employed in the manufacture of sheet metal guards, hoods, tanks, dashes, tool and battery boxes, mufflers and forgings, and also in the enameling in black and colors of the above parts.

The metal body plant, located at Widman and Harper avenues, in the northeastern section of the city, was opened for business on October 1st, of this year, and, at present, is employing more than 100 men in the manufacture of auto metal bodies. In this plant is one of the largest presses ever built for the stamping of sheet metal. This press was built to order for the Hayes Mfg. Co., at a cost of $15,000. The press weighs more than 100 tons, the bed is 12 feet, 4 inches, between uprights, and is large enough to stamp out parts for the largest bodies

ped to the manufacturers in the E
ern and Middle Western states. The co
pany is building parts this season
more than 100,000 cars and numb
among its customers nearly all the larg
automobile manufacturers.

The first set of metal guards used
automobiles was designed by Mess
Thompson and Schiedel, who are s
superintending the construction in
factory's output. E. D. Emmons, w
known to the automobile trade, is m
ager of sales; C. J. Colton handles the s
of tool and battery boxes to supply hou
and garages.

Detroit Shear Company

ABOUT a year ago the Detroit Sh
Co. placed on the market a sm
seven inch compound lever
pocket snip. The snip
received, at once, as a wonderful
provement over the ordinary snip
asmuch as it possessed many times
cutting power, and, in addition, w
cut with uniform power from the hing
the point of the blades. The company
ceived its first patent March 11, 1909,
the second, October 18, 1909. Immedia
thereafter they began the manufactur
larger sizes. All snips are made
solid cruicible tool steel.

The company is enjoying a remark
trade considering its time in the ma

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Cord & Co., of Chica-
Ill., the latter being manufacturers of
way supplies. The McCord Mfg. Co.
organized during the forepart of the
sent year to take over the auto parts
ness of the older corporation. Since
time the company has grown to be
largest manufacturer of radiators in
world. Working ten hours a day, the
out of the present year will total 75,-
Aside from radiators the company al-
manufacture force feed lubricators, fans,
ulating pumps and McKin gaskets.
Vhen starting, the company occupied a
r space of approximately 53,000 square
and in the first few months in opera-
it was learned that larger quarters
ld have to be secured. To meet this
uirement, an addition which practically
bled the capacity was begun and on
ober 1st, was finished and ready for
upancy. The company employs fully
men, and while this working force is
e sufficient to meet present needs, ad-
onal workmen will put on a night
t if it is found necessary to keep up

The officers of the company are: A. C. McCord, president; Morrell Dunn, vice-president; H. H. Newsom, general manager; L. M. Hamlin, secretary and treasurer; P. L. Barter, sales manager; J. W. Cain, western sales agent.

Detroit Socket Company

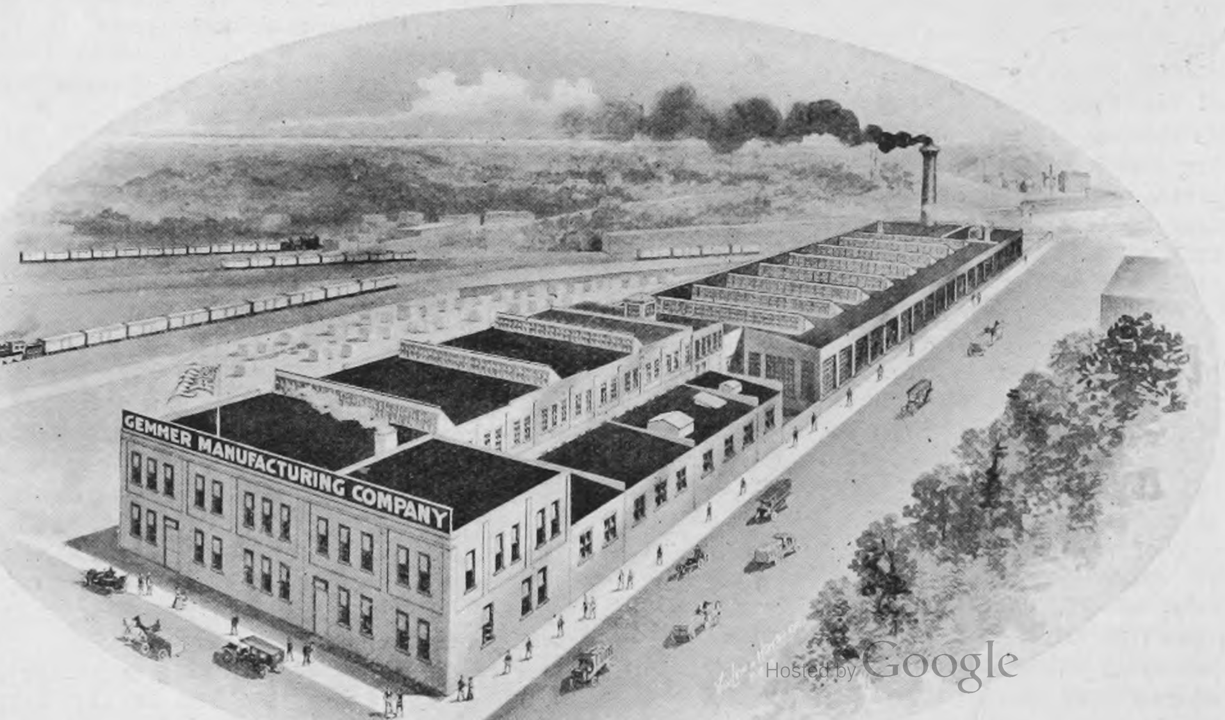
The Detroit Socket Co., has been organized but one year, but the company now claims a yearly output of 75,000 pieces. It occupies 20,000 square feet of floor space and specializes bow sockets. Some of the largest dealers in the country are supplied. The company has several features fully covered by patents and it is the belief of the officials that its products are ahead of other competitors. It is the intention of the concern to make all other lines pertaining to tops. Top irons, body irons, etc., will be featured and special machinery has been ordered to manufacture these lines. The officers are: President, J. C. Cass; vice-president, A. R. Lee; secretary and treasurer, R. H. Logan.

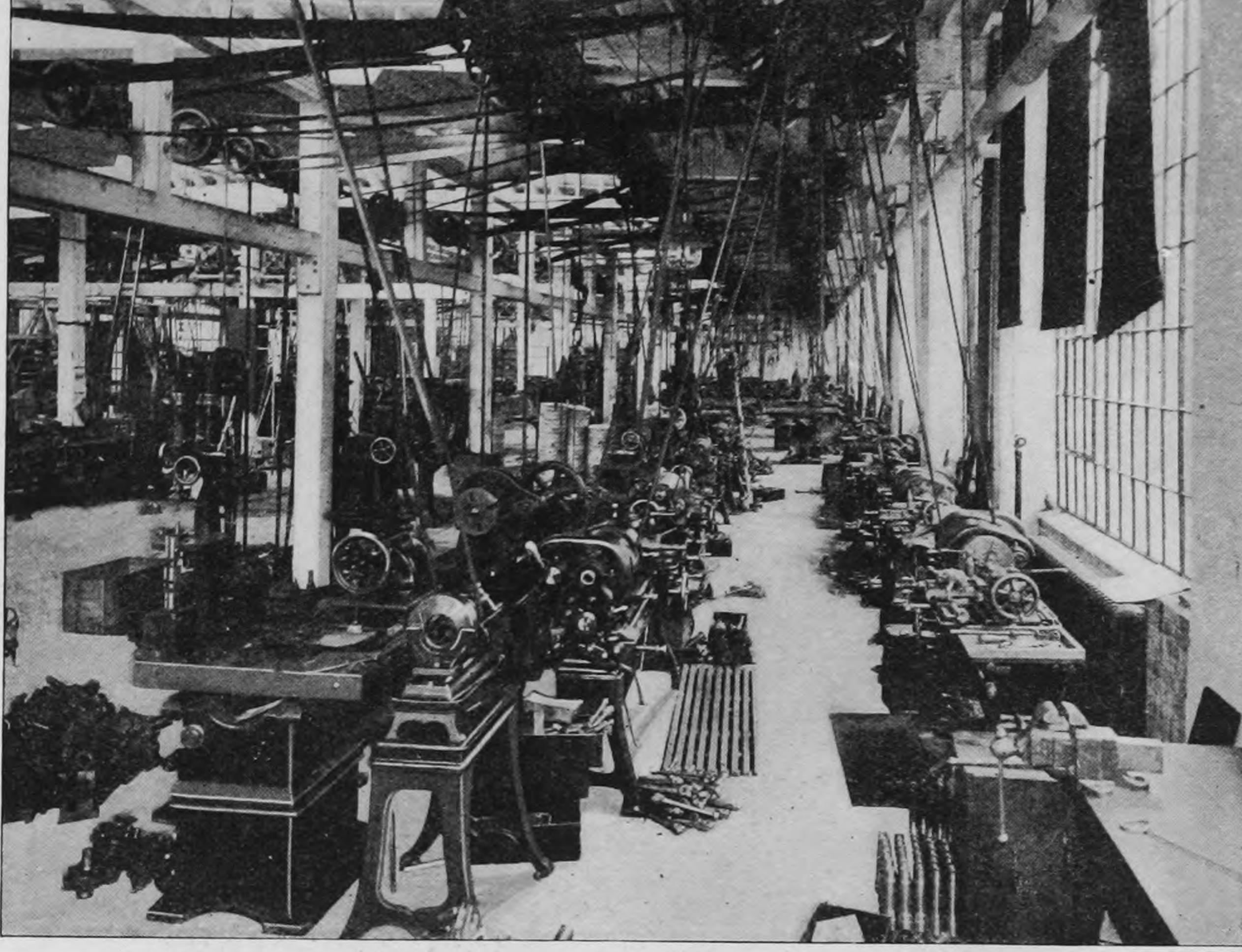
The Gemmer Manufacturing Company

he Gemmer Mfg. Co. has been keeping
e with the development of the automo-
industry in the growth of its plant
well as in the perfecting of its line
nanufacture. This company has made
pecialty of steering gears, starting

originally with the model "C" adjustable gear. As the demands of the trade justified, two other types were added.

To keep even with the demand for their product it was also found necessary, during the past summer, to more





One corner of the machine shop where the well-known Gemmer steering gear is made.

than double the size of the plant both in floor space and in machine tool equipment. The main factory building is one story with saw tooth section roof and is 80 x 300 feet and of the most approved modern construction. It is devoted entirely to the machine equipment, and a two story section, 60 x 150 feet, contains the assembling as well as the general offices and shipping departments. There are in addition, buildings for the rough stores, crating, polishing and blacksmith departments and the power plant. Electric power is used throughout, the company generating its own current. Gas is used for general illumination with small electric lights for each workman. As lighting is essential to good work both artificial and day lighting are as nearly perfect as possible. Gas is used in the treatment of steels, making it possible with the aid of pyrometers to regulate the work with great accuracy.

The machine equipment was carefully selected for the most economical and accurate production of steering gear parts possible with present tools. The equipment, together with efficient organization, has brought the daily average of shipments up to 100 complete steering gears, and all the specified deliveries on orders are being met promptly. The company is in a position to increase its output if necessary.

Greenslade Oil Company

The way of hundreds of automobiles in Detroit and other cities is smoothed by the application of oil manufactured by the Greenslade Oil Co. This firm was formed in Detroit 60 years ago. Its fac-

Robert Instrument Company

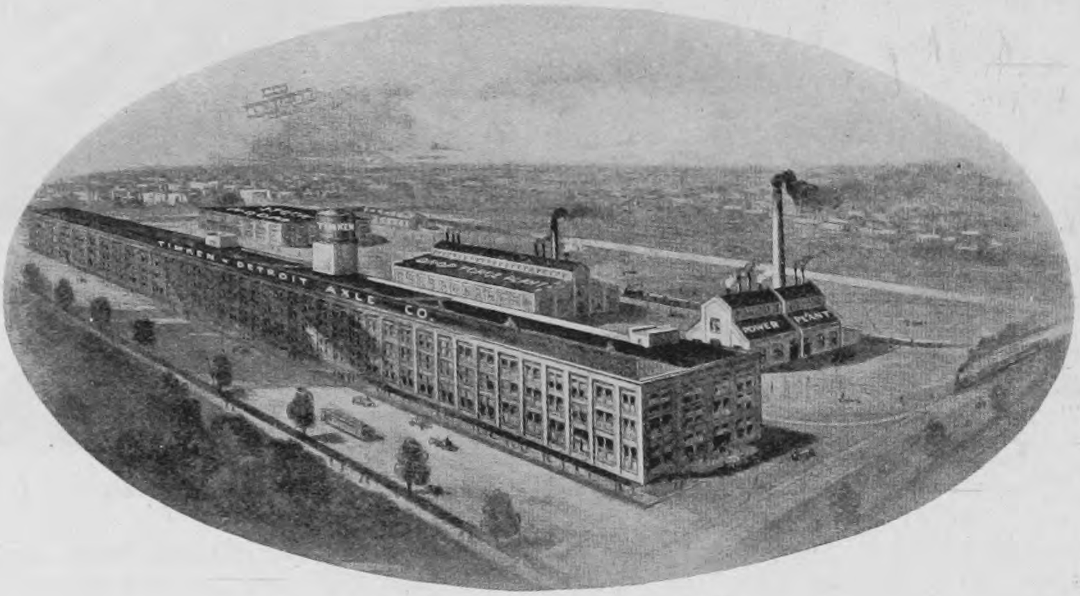
H. A. Abrahamson is proprietor and manager of the Robert Instrument Co. 56 Shelby street. The firm manufactures pocket volt-ammeters, ammeters, volt meters, miniature switchboards, ammeters and

Axle Co. is one of the latest and most important additions to the automobile industry of Detroit. The concern was formerly located in Canton, Ohio, as the axle department of the Timken Roller Bearing Axle Co. This division of the business was made necessary by the rapidly increasing growth of both the axle and bearing departments. The manufacture of roller bearings is continued with greatly enlarged facilities at Canton, O., under the title of Timken Roller Bearing Co., while the axle business is handled from the new Detroit plant.

process of manufacture, even to the hea treating of the metal is jealously watche by technical experts.

The Timken axle was the pioneer i pressed steel housing construction. Th new axle which is being shown to th trade represents, in its improvement, further step in development, and consist of two distinct units. A hollow, presse steel housing to carry the load is a separ ate unit carrying the bevel gear, pinio shaft and bearings.

The allied Timken companies supply ma terial to from 75 to 80 per cent. of th high grade automobile manufacturers o the country, and this splendid showin



Timken-Detroit Axle Company's Plant.

The majority of the skilled workmen employed in this plant, as well as the heads of the departments, were brought from the Ohio city, and they make an important addition to Detroit interests. This skilled and experienced force, in combination with the new and modern plant, retains all the advantages due to long experience in automobile axle building, together with the advantages of largely increased facilities.

The policy which has been responsible for the upbuilding of this immense business, has been strict adherence to quality, and never for one moment have the demands of insistent buyers for cheapness ever been permitted to interfere with the high standard set by the company.

All steel used in Timken axles is made to formula which is the result of seven years of catering to the exacting demands of the high grade automobile builders, as shown to be necessary by the thousands of cars in use in all parts of the country,

has been made in the face of the fierces competition, and strictly on the merit of the goods.

The officers of the company are: Presi dent, W. R. Timken; first vice-president H. H. Timken; second vice-president an production manager, A. R. Demory; sec retary and treasurer, E. W. Lewis; chie engineer, H. W. Alden, assistant secre tary, F. C. Gilbert; purchasing agent, W H. H. Hutton, Jr.

Michigan Storage Battery Compan

Since the organization of the compan seven years ago the Michigan Storag Battery Co. has found it necessary to see larger quarters on three different occa sions. The company is now located at 6 Atwater street east, and it turns out th Michigan and Vim batteries as well a the Wizard Lighting battery. The outpu it about 8,000 yearly and the concern sup plies the Ford, Chalmers-Detroit and Re

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ufacturing spark plugs, commutators and wind shields. The firm, which has offices at 372 Michigan avenue, does a wholesale, retail and jobbing business, and, in spite of this being a dull season in the automobile trade, is being worked to capacity to supply the demand. Mr. Wachman is manager.

The Automobile Equipment Company

The Automobile Equipment Co., with general offices at 260 Jefferson avenue west, enjoys the distinction of being the oldest established auto supply house in Michigan. The company has been established seven years, having moved into its present location about five years ago. As one of the firm put it, they have everything there "for man and motor."

The company specializes in windshields, rear sight mirrors, Zero fluid and general automobile supplies. It supplies several of the largest dealers in the state and caters particularly to the jobbing trade.

Its officers are: William J. Palms, president; P. E. Hawley, vice-president; F. S. Evans, secretary and treasurer.

Detroit Lubricator Company

The Detroit Lubricator Co. originated the present type of sight feed lubricators for both industrial and locomotive engines and is one of the most extensive manufacturers of these devices. The officers are: chairman of the Board of Directors, H. C. Hodges; president, C. H. Hodges; vice president and general manager, C. B. Hodges; secretary and treasurer, F. W. Hodges.

It is the boast of the company that its products are now in use in nearly every civilized country on the globe. The present type of bullseye locomotive lubricator, in use on a great many of the roads of the United States, was also originated by the Detroit company and it is being manufactured in large quantities to meet the demand.

The products of the company consist of lubricators, lubricating devices for every possible condition, including plain lubricators, brass and glass oilers, brass and glass oil pumps, multiple oilers, lubricating devices, grease cups, boiler oil injectors, low water indicators, throttle valves, globe

has worked up a yearly demand for 10 000 parts. It specializes on auto part such as fenders, hoods, gasoline tanks, a kinds of sheet metal stampings and coo ing fans. The company occupies son 20,000 feet of floor space at 909 Gree wood avenue. The officers are: Pres dent, Oscar Schimmel; secretary, Josep Manniere; sales manager, E. B. Tompkin

Baird Machine & Mfg. Company

The Baird Machine & Mfg. Co., 11- Raynor street, has been established fo years, first as a partnership as Baird Henselwood Machine Co., but about th first of the present year the Baird Machin & Mfg. Co. took over the property and fil articles of association with a capital $15,000. The officers are: W. J. Bair president and treasurer; Andrew Bair vice-president and superintendent; Cra ford Baird, secretary.

All the officers of this company are me of several years' experience in the machi and automobile and marine engine bus ness. The company also makes a special of tools and jigs for the automobile trad Aside from the above it also manufacur a line of noiseless air compressors. T company also manufactures the celebrat Yale marine motors.

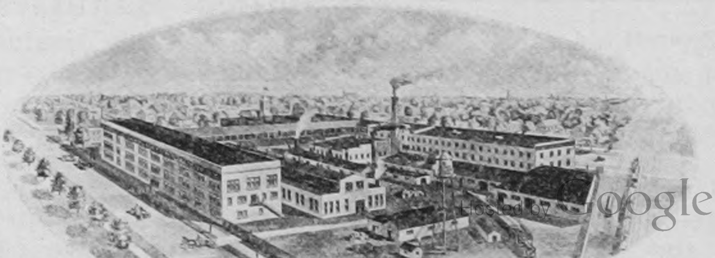
Peninsular Milled Screw Compan

The Peninsular Milled Screw Co. h been in business since 1892. The firm factory was burned a few months ago a it is now in larger quarters than it pre ously occupied. The equipage has be increased one-third and upwards of 40,0 feet of floor space are utilized. The co pany supplies automobile manufacture and has sufficient orders now on hand keep all wheels turning for six months come.

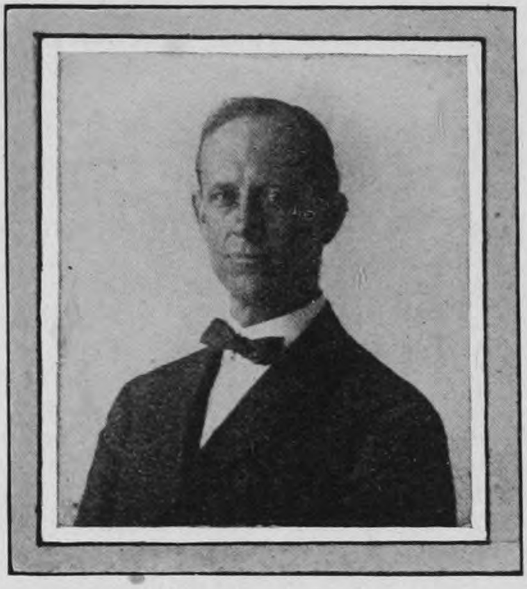
They employ about 150 men, half these being skilled laborers. A sort school of instruction is kept. The co pany takes in unskilled workmen a teaches them the art and aims to keep workmen with it as long as possible.

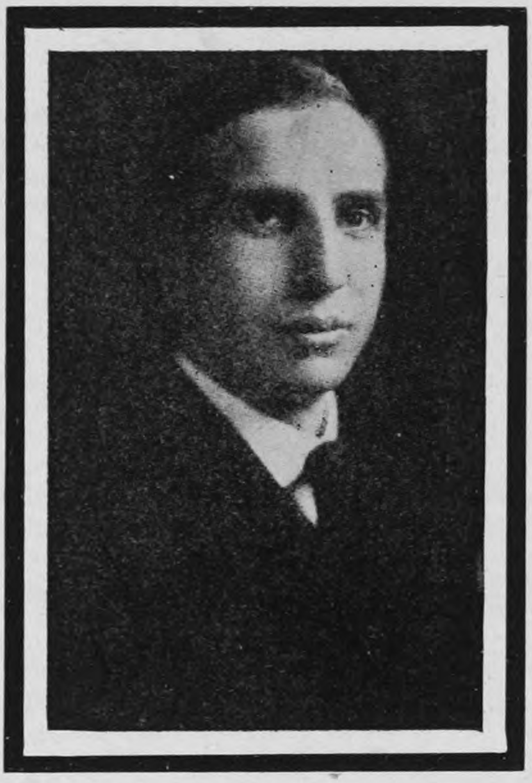
It specializes no particular line. Ho ever, a greater demand is experienced f the split lock nut and the ball and sock joint for comm tator and carbu tor control. M of its goods a made up fr customers' b prints.

The office are: President, J. Conn; vi



urpose of the organization being to manufacture screw machine products and automobile parts. The demand for the "S & W" stationary nut patented steering gears, nd the "S & W" electrically welded "safe-y" reaches, was so great that it was ound necessary to move into much larg- r quarters and to increase the capital so hat on June 1, 1909, the partnership was lissolved, and the Schweppe & Wilt Mfg. Co., was organized with a capital stock of 70,000, of which $60,000 was paid in. At he present time the company employs


Marvin Gorman, Sec. and Treas.


A. D. Wilt, Jr., Vice-President and General Manager.

treasurer, Marvine Gorman. Both Mr. Schweppe and Mr. Wilt are graduates of Harvard University, while Mr. Gorham is a graduate of the Massachusetts Institute of Technology. All three men have had long experience in the business.

Both the stationary nut steering gear and the safety steering reach are unique in several respects. In addition to these devices the company manufactures screw machine products.

American Lubricator Company

The American Lubricator Co., with a factory at 93 and 95 Catherine street, manufactures all kinds of lubricating devices. In this list are included feed oiling devices, oil cups, priming cups, special bearings, aluminum castings, bronze castings and all kinds of bearing metals. The company also manufactures steam engine lubricators.

The management recently underwent a change, the present officers being: President, George H. Kirchner; vice-president, Mr. Burch; secretary and general manager, A. G. Laird; treasurer, Douglass McCracken.

The output of the company is placed at 100,000 annually and orders are now coming in so fast that preparations are being made to double the capacity of the plant. Plans are already under consideration for a new factory on the west side of the city. The firm supplies some of the largest manufacturers not only in this country but abroad.

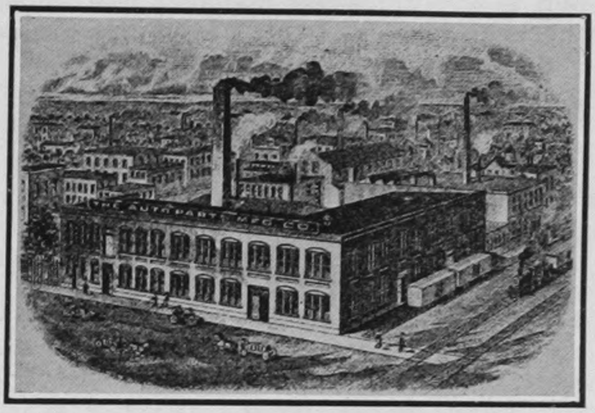
Auto Crank Shaft Company

Since its organization in 1906 the Auto Crank Shaft Co., with R. M. Bronson, pres., and J. M. Hibbard, secretary, treasurer and general manager, has found a ready market for its products. The yearly output now totals about $145,000, mostly crank shafts. Business is so great that already plans are being laid for the firm to double its capacity and when the proposed buildings are finished a total floor space of 25,000 square feet will be occupied.

United Manufacturing Company

A two-cycle engine, equally useful in automobiles, in factories, or in launches, is the product of the United Mfg. Co., 171 Woodbridge street west. By the simple changing of the base the "little giant," as this engine is known, can be fitted to almost anything requiring an engine. The manufacturers are equipping automobiles

Parts Manufacturing Co., has changed its name to "The Autoparts Manufacturing Co.," and last July it filed articles of association with $100,000 capital. The officers



Auto Parts Mfg. Co.'s Plant.

are: A. O. Durch, president and general manager; L. A. Austin, secretary and assistant manager. Mr. Austin was formerly connected with the Northern Motor Car Co., as manager, and was also manager of the repair sales department with the E-M-F. when it consolidated the interests of the Northern Motor Car Co.

The object of the concern is to handle all repair parts for users of machines from the Wayne Auto Co., Northern Motor Car Co., and C. H. Bloomston Motor Car Co. The firm has all patterns, gigs, tools and drawings necessary for the carrying on of this work and it is gradually taking in contract work, making a specialty of rear axles both with and without transmission. The company uses the best grade of raw material obtainable and it plans on extending its facilities so as to include the manufacture of other auto parts and specialties of all kinds. The company now has an annual output of 500,000 parts.

The Gray Hawley Company

The Gray Hawley Co. was organized in 1905 for the purpose of manufacturing auto muffllers, horns, cut-outs, foot pedals, motorboat whistles, whistle outfits, steering devices, marine engines and motorboat mufflers. The officers of the company are: president, Emmett P. Gray; vice president, O. B. Hawley; secretary and treasurer, George E. Hawley.

Like many other concerns this company started on a small scale. Its present output is more than five times as much as the original total. The company now employs 60 men and is preparing to move into larger quarters next spring. Plans for the

Coombs is owner and proprietor, has b in existence since 1904, and the firm s cializes an auto tops. The company's out this year will total 2,000, and because inadequate capacities Mr. Coombs is pl ning in the early part of 1910 on mov into a new factory, at Brush and Wo bridge streets.

Jos. N. Smith & Company

The business of the Jos. N. Smith & was organized in 1875, and, like ma other successful concerns, has grown fr a very small beginning. Many of earlier years, especially since 1890, w devoted entirely to the carriage trade, company making a line of plated carri rails and name plates. The previ years were devoted at first to what known as close silver plating, or ha plating, which was much in vogue on c riage rails, the rails being forged by company using them. From 1888, up the present time, the company has ma a specialty of detachable carriage ra Since April, 1903, the automobile mount line has been taken up and while start in a small way the business has develop until now the company has a very br line. It can furnish nearly all mounti wanted for bodies in connection with standard touring cars. The company gradually extending its work and even ally will be able to supply anything want in the hardware line for automobiles

The company lately took up the ma ufacture of malleable iron hinges. Th are furnished in all regular sizes, 1½, 1 2 inches straight pattern, and 1¾ and inches in the curved patterns, as well French head hinges. Upward of 200 m are now employed, and a decided mont increase in business has been noted fr month to month. The 1909 business w exceed the combined figures of 1907 a 1908, and the average business per mo during the present year will be largely excess of the highest previous month concern has ever had. The company att butes its success to the fact that it gi the closest attention to details in c nection with making the goods. only does this give satisfaction, but it a avoids unnecessary delays in correct such matters.

Charles E. Chamberlin, president of company, is in active command of the f tory and the very careful and tirel manner in which he follows the reque of customers attributes to the concer increased trade. E. L. Ackerman,

Detroit Auto Shield Company

The principal product of the Detroit Auto Shield Co., of which Tom Swan is owner and manager, is the Swan curtain clip. The company supplies many of the largest dealers, and while it also manufactures windshields, the latter are not featured. Mr. Swan has had 20 years experience in this line of work.

Detroit Leather Works

Henry Kaiser and Joseph H. Schulte purchased the holdings of the Detroit Leather Works, and while the company still runs under its original name, the firm is a partnership. As this is the first year the new firm has operated it is hard to tell the output. However, the company is enjoying a heavy trade. Its specialty is the Flexo fan belt. The firm also manufactures universal joint hoods, magneto hoods, steering knuckle boots, washers and tire coverings.

Detroit Roller Bearing Company

The Detroit Roller Bearing Co., recently capitalized at $50,000, has for its officers: President, O. F. Zahn; vice-president, A. B. Hibbard; secretary, treasurer and manager, J. M. Hibbard. The company will manufacture roller bearings for automobiles and has ordered equipment for a capacity of 400 bearings a day. Factory buildings will be erected at 196 Piquette avenue.

C. R. Wilson Body Company

The C. R. Wilson Body Co. was formed 35 years ago for the manufacture of buggies, but since the advent of the motor car has occupied itself exclusively in turning out automobile bodies. Both metal and wood bodies are made, the majority however, being metal. The firm employs 600 men in its factory at Clay avenue and the Grand Trunk Railroad, and is adding to this number as fast as suitable men can be found.

C. R. Wilson, is president; C. H. Wilson, vice-president; P. D. Dwight, secretary-treasurer.

Detroit Steering Wheel Company

The Detroit Steering Wheel Co., with a factory at 274 Wight street, has been established two years and it now records a yearly output of 100,000 parts. The firm supplies the largest dealers in the Detroit district, and business is coming in such volumes that plans are being laid for the erection of another addition. The company has been in its present location since starting and it now occupies about 15,000 square feet of floor space. It specializes on solid bent steering wheels and spiders. The officers are: President, H. J. Denk; secretary and treasurer, E. L. Denk.

Detroit Motor Car Supply Company

The Detroit Motor Car Supply Co., one of the best known auto top manufacturers in the country, was organized some eight years ago. The growth has been a surprising one, starting from 100 tops up to several thousands yearly. William F. Cornell is general sales manager and is putting out tops in Fairfield rubber, Mohair and Pantasote. The company's slogan is "Tip-to-top for any car on 24 hours' notice."

Michigan Auto Parts Company

The Michigan Auto Parts Co., manufactures transmissions, transmission gears and multiple disc clutches. Transmissions are turned on a design furnished by A. P. Brush, C. E.. of the General Motors Co., and the plant has a capacity of 50 a day. Within a month the company will increase the force at its factory, 1559 Jefferson Avenue west, from 150 to 200 men. H. Green is secretary and general manager.

Detroit Motor Castings Company

The Detroit Metal Castings Co. has been in business four years and during that time has created a business of such magnitude that it is now supplying about 20,000 automobiles with bearings, water and gasoline manifolds; carburetors, gear shifting yokes and oil and water circulating pumps each year.

The company is running full capacity and occupies 35,000 square feet of floor space. It does all contract work and will probably erect an addition next spring. The officers are: President, E. J. Roney; vice-president, M. G. Skinner; secretary, treasurer and general manager, J. C. Danziger.

Detroit Metal Parts Company

The Detroit Metal Parts Co., with a factory at 907-9 Michigan avenue, was incorporated this year under the laws of the State of Michigan, with a capital of $15,000. The officers are: President and treasurer, G. D. Pope; vice-president, B. S. Colburn; secretary, J. B. Schlotman; general manager, W. J. Baird.

The company makes a specialty of automobile parts. It has a first class foundry in connection and this foundry is equipped with machinery for the manufacture of brass, bronze and aluminum castings. The company also makes a specialty of finishing all special bronze bearings for motors and automobiles and large contracts for these parts have been received from many manufacturers, and the company is increasing its facilities for handling larger contracts. Two floors, covering a floor space of about 10,000 square feet are used and it is planned to increase the capacity about the first of the new year. The officers of the company are thorough and well-known business men who plan to make this one of Detroit's leading industries.

Michigan Copper & Brass Co.

The Michigan Copper & Brass Co. has been organized two years and in this time it has become very generally known. The company is capitalized at $800,000 and its output consists of wind shield, tubing, sheet brass, brass tubing and wire rods. The officers are: president, George H. Barbour, Sr.; vice president, James E. Banaher; secretary and treasurer, George H. Barbour, Jr.

Hibbard Engineering Company

The officers of the Hibbard Engineering Co. are: President, Robert M. Bronson; secretary, R. H. Baldwin; treasurer and manager, J. M. Hibbard. The company has been in business two years and it acts as a selling company for several Eastern concerns, among which are the Heinze Electric Co., of Lowell, Mass., Thermoid Rubber Co., Trenton, N. J., and the Lumen Bearing Co., of Buffalo, N. Y. The company has a complete well-organized selling force. The 1908 sales totaled $250,000 and this year that amount will be doubled and from present indications in 1910 the total sales will crowd the $1,000,000 mark.

Metal Produce Company

The Metal Produce Company is about the latest addition to the auto and auto parts industry in Detroit, having been incorporated only last month. The new concern has a factory nearing completion and will soon be able to supply the trade with axles and other parts. The capital, $200,000, has all been subscribed and the officers elected. E. E. Keller, a former vice president of the Westinghouse Machine Company, is president of the new concern. H. L. Barton is vice president, and W. F. Evans, also formerly with the Westinghouse Machine Company, is manager of works.

Detroit Carriage Company

Since its establishment 11 years ago, the Detroit Carriage Co. has steadily expanded until now its yearly output is approximately 400,000 automobile bodies. The company turns out wood bodies exclusively and it sells to many of the largest automobile manufacturers in the country.

Since its organization the company has outgrown its capacities several times. Additions have been erected at different periods and the company now utilizes a floor space of 76,000 square feet, and even with this capacity the officials sometimes find themselves crowded to get the work out on time. The factory runs 24 hours daily and from present prospects will continue doing so for some time.

The officers are: Henry W. Paton, president and treasurer; Parker O. Pennington, vice-president; Albert H. Roehm, secretary.

Michigan Crucible Steel Castings Company

The Michigan Crucible Steel Co. was organized three years ago to manufacture small steel parts for automobiles. The factory, which gives employment to 100 men, is located at 248-50 Guoin Street. Officers of the company are: president, R. F. Flintermass; secretary, E. B. Caulkins; treasurer, A. H. B. Hoyt.

J. C. Coleman

J. C. Coleman is owner and proprietor of a factory at 58 and 60 First street, and makes a specialty of automobile and motor boat steering wheels. Mr. Coleman formerly manufactured windshields, but because of the heavy demand for his other products he has temporarily discontinued the making of shields, but will again take up their manufacture as soon as larger quarters have been secured. Mr. Coleman has been in the business four years and his output is now approximately 30,000 wheels yearly.

B. F. Everitt Company

The B. F. Everitt Co. has three different Detroit plants which are engaged in the work of trimming and painting automobile bodies. The company does both wood and metal bodies and makes fancy trimming a specialty. Its different plants are at Clay avenue and the railroad; Hastings street and the Boulevard, and on Clark avenue in the new Studebaker-Flanders Building. It has a capacity of 70,000 bodies yearly. In its three plants it utilizes some 10,000 feet of floor space.

The officers are: President and manager, W. O. Briggs; vice-president, R. S. Everitt; secretary and treasurer, F. M. Shinnick.

Holley Brothers

Holley Bros. began the manufacture, on a small scale, of Loguemere carburetors, in Bradford, Pa., in 1889. The company first worked on a royalty basis, but later took up the manufacture of its own products. Finding the demand for these so great and realizing that much of their trade must eventually come from Detroit, the firm moved to the "Automobile City" in 1904.

When starting here it began manufacturing on a slightly larger scale than it had done in Pennsylvania, but the demand for the products grew so rapidly that the output now totals several times the original figures. The production for 1909 will be 50,000 carburetors, and prospects are that this number will be greatly exceeded in 1910. The company has recently equipped a special testing laboratory and is considering moving into larger quarters. Its capital is $10,000.

The officers are: President, G. M. Holley; vice-president and treasurer, Earl Holley; secretary, George R. Welch.

Hyatt Roller Bearing Company

Among the industries which have been attracted to Detroit since it became the automobile manufacturing center of the world .is the Hyatt Roller Bearing Co. While the factory and works of the concern are in Newark, N. J., the enormous amount of business which comes from Detroit made it prudent to move the general sales offices to the City of the Straits.

The growth of the Hyatt Roller Bearing business has been phenomenal. The chief reason for this is that the product which the company turns out is unsurpassed for the purpose for which it is designed.

Even while this has been the case, of a necessity some one must bring these bearings to the attention of automobile manufacturers. The great popularity of the Hyatt bearings is due to a large extent to the individuality and the persistant effort of one person. This person is known officially at Peter S. Steenstrup, alias, "The Hyatt Man."

Mr. Steenstrup is general sales manager for the company. He is also secretary. There probably is not another man who is better known in the engineering offices of the different automobile factories of the country than "The Hyatt Man."

Mr. Steenstrup is a director and holds the secretaryship of the association of Motor & Accessories Manufacturers. He has always taken an active part in this organization and has done considerable to bring it to the place it now occupies in the commercial world. He is also a member of the American Society of Mechanical Engineers, and a member of the Society of Automobile Engineers.

The vast amount of work in and about Detroit made it necessary to maintain continuous headquarters in a local hotel, and for this reason the company opened a Detroit office about one year ago. Detroit's growth as an automobile manufacturing center continued at such an amazing pace that about six months ago it was decided to locate in Detroit the general sales office of the Hyatt Roller Bearing Co.

Auto Accessories Manufacturing Company

The Auto Accessories Manufacturing Co. began business five years ago, occupying three floors of the first building erected in Detroit which was devoted exclusively to the trade. Two years after organization the company found it necessary to seek larger quarters and it then located in its present building at Congress and First streets.

The company makes a specialty of tops and windshields and its annual output in both is 10,000. It supplies large dealers doing but little factory business. It also carries a complete line of accessories for the retail and jobbing trades.

A new detachable top is one of the features which the company will put out during the coming year. Heretofore in tonneaus it has been necessary to either shut off the rear seats from a view ahead or leave the entire car unprotected. A touring car top made it impossibe to detach the rear seat without taking off the top and to alleviate this the firm will start the manufacture of a combination top. It will then be possible to take off the rear seat without disturbing the entire top.

The officers of the company are: President, William E. Metzger; secretary and treasurer, L. A. Howard.

Rands Manufacturing Company

The Rands Mfg. Co., makers of automobile equipment with a factory at 67-89 East Fort Street, was originally known as the Wheeler Manufacturing Co. This latter company was organized in 1889 for the purpose of making bicycle grips and saddles. In 1904 this line was discontinued and the company began the manufacture of wind shields, tops, body irons, lamp brackets, trunk racks, tire holders, etc. Since organization the concern has increased its business 100 per cent. The present capitalization is $25,000.

The officers of the company are: president, Charles A. Martz; vice president, R. A. Rands; treasurer and manager, W. C. Rands; secretary and assistant treasurer, L. Vineberg.

The company employs in the neighborhood of 350 men and this year's output of wind shields will total at least 50,000. The capacity on tops and other equipment will be about the same.

Edmunds & Jones

The firm of Edmunds & Jones started business in 1904 as manufacturers of special automobile lamps in acetylene, oil and electric and to-day the company is making a full line of this class of goods. While starting on a small scale the capacity of the company has greatly increased until now a factory building 215 by 60 feet, and three stories high is entirely taken up. The power plant is 40 x 60 x 18 feet. The concern now employs 150 men and it expects to increase this number to about 250 within the next 90 days.

The concern has grown to be one of the leading firms of its kind in the country and the output for 1910 will be greater than ever before. By the end of July, 1910, which is the end of the company's fiscal year, the output for the twelve months will have exceeded 250,000.

The company's specialty lies in the originality and practical features of oil and electric side lamps and its makes a very strong special feature of its model L tail lamp.

The Gunderson-Walter Company

Another company has been added to the long list of Detroit concerns engaged in the automobile industry. The newcomer is the recently incorporated Gunderson-Walter Company, located at 182-194 Bellevue Ave., where an up to date one-story saw tooth roof machine shop of brick has just been completed and equipped with up-to-date machinery. Although a new company, the principals, V. M. Gunderson and Fred Walter, are well known as the former Secretary, Treasurer, General Manager and Superintendent respectively of the Northern Motor Car Co., of Port Huron, Mich., and who, last year sold their interests in that concern to the E-M-F. Co.

The Gunderson-Walter Company, styled as "contracting machinists" will manufacture, in their new factory, automobile parts, making a specialty of engines, transmissions, rear axles, steering gears, reaches, etc.

K. H. Wheel Company

The K. H. Wheel Co., with a factory building at 1220-40 Military avenue, is one of the new automobile parts concerns in Detroit. The company was organized during the latter part of 1908 and early in the present year active operations were started. John Kelsey is president and general manager, and W. H. Ducharme, is secretary and treasurer. This company took over the interests of the Detroit Bent Goods' Co., manufacturers of spokes and rims for wheels of all kinds of automobiles.

The K. H. Wheel Co., now manufactures automobile wheels of the regulation artillery type as well as a patented spring wheel. It also builds all styles of rims in both clincher and demountable patterns. Its plant covers four acres and this year it will turn out 75,000 sets. The capital is $300,000 and close to 400 men are employed.

Detroit Leather Specialty Company

The Detroit Leather Specialty Co. has discontinued the making of automobile gloves and is only catering to the automobile trade through its clutch sweaters.

Osburn Electric Company

Although established less than three years ago the Osburn Electric Co., 66 and 68 Fort street east, is finding a demand more than equal to its capacity, and the officers are making preliminary arrangements for moving into larger quarters. The attention of the company is devoted to ignition specialties.

The offices are: President and general manager, H. G. Osburn; vice-president, J. C. Osburn; treasurer, R. G. Hutchins; secretary and advertising manager, F. E. Hutchins; sales manager, Harry R. Brate. The company recently filed articles of association with a paid-up capital of $100,000.

Harry G. Osburn, president and general manager of the company, has been in the automobile business for 22 years. He formerly manufactured electric vehicles and was one of the first exhibitors in the early automobile shows in Madison Square Garden, New York City. Some ten years ago Mr. Osburn dropped out of the automobile business and became interested in storage batteries. He relinquished his interests in the storage battery business to take up the manufacture of ignition specialties.

During the last two years the attention of the company has been principally directed to the perfecting of machinery for the manufacture of their articles and this work is now practically completed.

G. H. Sherman and Sons

G. H. Sherman and Sons have been in business at 419 St. Aubin avenue since 1907. A demountable spark plug is their specialty.

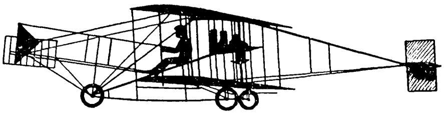
Essex Brass Company

The G. B. Essex Brass Co., was formed nine years ago. Its principal output is lubricators, but other small brass auto attachments are manufactured. From a small beginning the concern, of which G. B. Essex is owner and manager, has grown so that it now employs 100 men, and a large addition has just been completed.

The Muzzy-Lyon Company, Ltd.

The Muzzy-Lyon Company, Ltd., owners of the Mogul Metal Company, 149-151 Larned street, W., makes a specialty of Mogul Die Cast Bearings.

The present capacity of the plant is from 5000 to 10,000 bearings per day, while the great demand necessitates the addition of more machines. This concern owns and operates its own Babbitt metal plant, die shop and casting plant. The bearings are entirely under their supervision from the time the alloy is made until they are finished ready to be placed in use. J. H. Muzzy is secretary and treasurer of the concern, and E. F. Lyon, chairman.



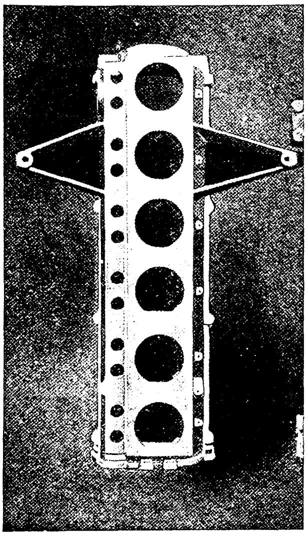
¶ The North Pole has been discovered. We do not care who discovered it; but, we would like to take a look at the bearings, pretty sure to be **Plastic Bronze**, considering their cool running.

¶ Aeroplanes are flying. Curtiss has beat the lot of them. He used **Aerial Brand Aluminum** Castings; a New Brand we have just brought out for Flying Machines.

¶ While we spend time and money in developing new alloys suited to new fields of development, we still give our best efforts to our

Automobile Brand of Aluminum and Bronze Castings

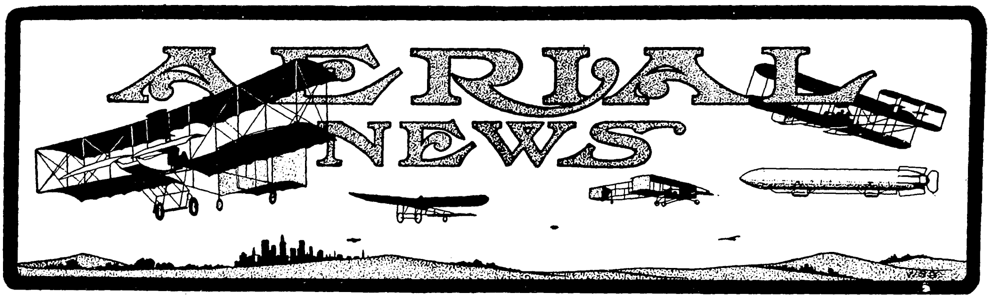
¶ These alloys have been developed not by accident, but by knowing the requirements and meeting them.



Light Mfg. & Foundry Company

Pottstown **Pennsylvania**

Sales Offices, Real Estate Trust Building, Philadelphia, Pa.



AN HOUR WITH WILBUR WRIGHT

E. S. FOLJAMBE.

During the eventful week of the Hudson-Fulton celebration at New York, the writer had the pleasure of an interview with Wilbur Wright, who was then preparing his machine for the successful flight which was made shortly after up the Hudson and return to Governor's Island.

I found Mr. Wright very much more talkative than had been anticipated, and very willing to give information concerning his machine. At the time, the flyer was standing on two temporary iron wheels which facilitated rolling it out of the shed onto the sands of the island, to the starting rail some two hundred feet from the door. In these flights, the starting tower and weight usually used were dispensed with, the machine simply being held until the propeller was in motion, and upon being released by the assistants was driven along the rail by the propeller alone, rising gracefully at a very gradual angle just before reaching the end of the track. This rail consists simply of some planks standing on edge and capped with a metal strip.

As is well known by most of our readers, the Wright machine carries a set of skids very similar to sleigh runners instead of wheels as used by nearly all the other contestants for aerial honors. A cross-shaped affair, upon one cross-bar of which the sled-like runners of the aeroplane are placed, and upon the ends of the other bar of which small iron wheels were attached, forms the truck upon which the aeroplane rests on its monorail. The small wheels are not over five inches in diameter, wide enough to straddle the top of the rail and are flanged on each edge. The machine balances itself as soon as released, and when it rises leaves the truck resting on the rail and ground.

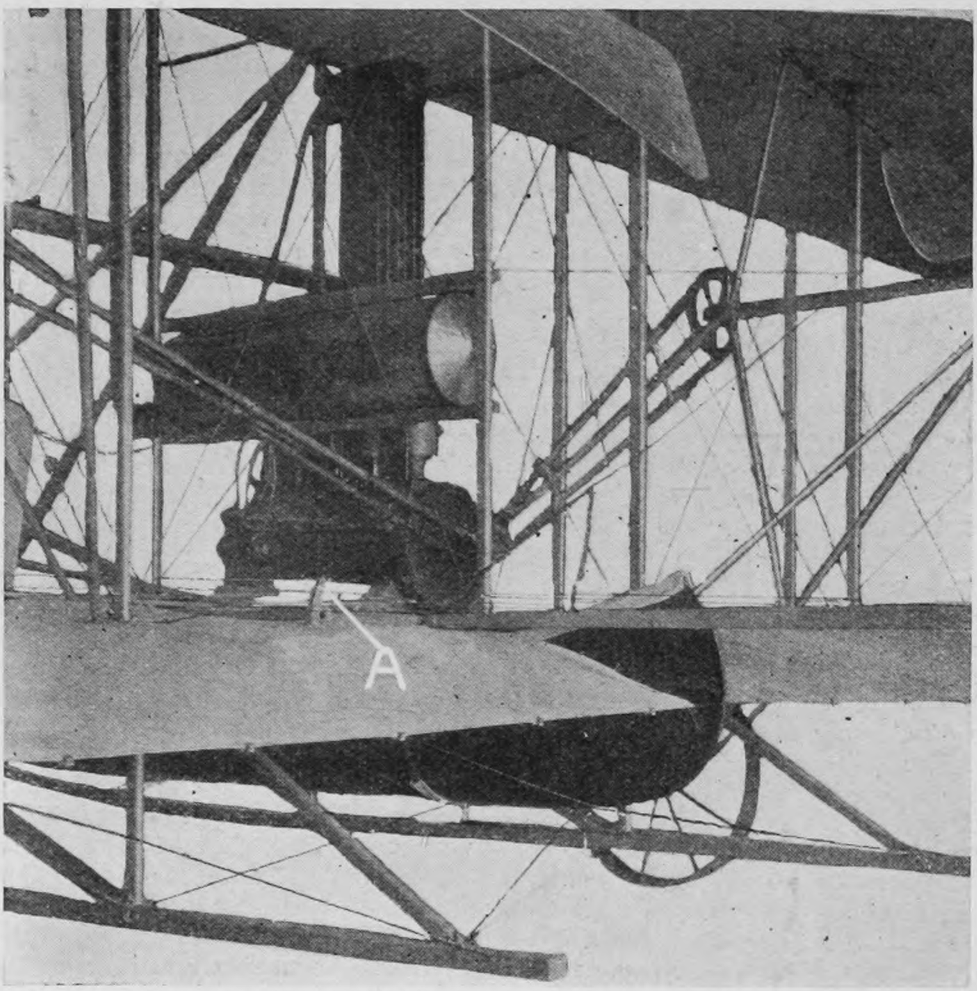
Upon being questioned as to whether it was always necessary to lay the rail directly into the wind so that the machine would start into the face of the breeze, Mr. Wright stepped over to the front part and taking hold of a strip of rag about two feet and a half long, remarked that in his last flight, referring to a preparatory flight on the island, this little ribbon swung out so, holding it off at an angle of 60 degrees to the fore and aft centre line of the machine, thus indicating that the wind was blowing very much to one side. Of course, under these conditions it was necessary to warp one of the planes considerably to remain on an even keel. A discussion of the rail method as compared to wheels brought out the fact that he was able to start in a very much smaller or confined space than could any of the machines fitted with wheels, which had to take a run over the rough sand. Under the latter conditions, a run of three hundred feet is often necessary before the plane will rise. In the accompanying photographs, which were taken in the dimly lighted shed, and are therefore not as clear as they might be, can be seen two views at close range of the Wright aeroplane. In Fig. 1, which is a rear view, is seen the rear of the skids, and one of the temporary wheels before mentioned. The engine is clearly shown in its position on the lower plane to the right of the centre. The chains which drive the twin propellers can be seen running to the right through tubing and to the left through cross tubes. These tubes prevent the chains from slashing and grinding against each other, and prevent the possibility of their jumping the sprockets. The tip of a canoe can also be seen. This was placed under the middle in a fore and aft position between the two skids, two-thirds of the length being in front of the planes, Mr. Wright calling attention to the fact that as the rear edges of the planes curve downward, if the machine should skim the water, these rear edges would throw the front end downward so that the whole flyer would be apt to cut under the water if going at speed, and it might be difficult for him to extricate himself under water from the numerous stay wires, braces, etc. He said, "Yes, we have the canoe there, but we are not going to use it," and smiled in his quiet assuring way and subsequent events proved that he was correct. This canoe was covered over with a closely woven piece of canvas of light weight, which would prevent it from filling, in case it should strike the water.

PREFERS WATER-COOLED MOTOR.

The gasoline tank carrying sufficient fuel for more than three hours, is located almost at the center in a fore and aft header at the top and the bottom. This radiator also acts as tank, Mr. Wright stating that he simply poured water in until it spurted out of a small hole about a foot from the top, from which a small plug had been removed for this test. When questioned as to air cooled cylinders, he remarked that he did not believe in them and further stated that he had used them on that very engine having removed the water cooled cyiinders and placed air cooled cylinders instead, and found that with continuous running, there was a tendency to so heat the motor that what might be gained in weight by not having the water and a radiator was more than offset by the fact that the motor did not give as much power.

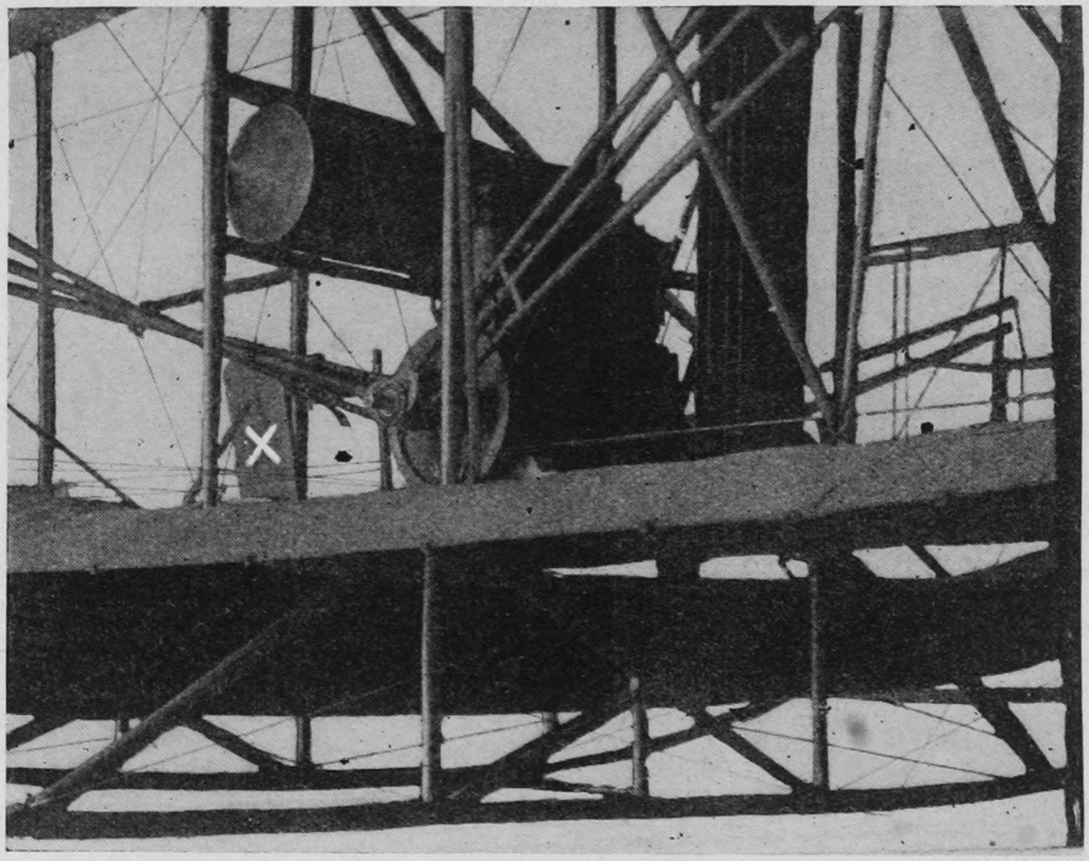
This has been the experience of the Wright Brothers with their own motor, and it is worthy of notice that Glenn H. Curtiss, a strenuous advocate of air cooled motors, is also supplying his commercial aeroplanes with water cooled motors, and lso used a water cooled motor of racing ype, when making his record flights at

enthusiastic, and immediately got into th seat of the machine and grasped the leve to his left, which operates the forwar horizontal rudder or elevator, and said "It requires almost no pressure at all t shift this lever and by means of this littl friction band around the small drum a the base of the lever, it will stand in any position desired, and the hand can res lightly on it or let go of it entirely, if desired, so that it is not at all fatiguing as far as manual exertion is concerned." In fact, he stated that during some of his flights, for over an hour he hardly touched this lever which changed the altitude, and would not move it over a quarter of an inch and that he had flown in a calm day when he could almost go to sleep on the machine as far as having to control it was concerned. Yet at other times the wind was so choppy that he was kept busy every second, shifting the control levers. He smilingly remarked that he liked that better than when the air was perfectly still, as there was a little bit more to it, and it gave him more pleasure than flying



Rear view of details of Wright aeroplane with canoe attached.

ther cause. In speaking of the balance, e stated that this particular machine was lightly out of balance, that the engine aused a slight tipping to one side, and hat with an extra passenger, the machine vas more nearly in balance and flew beter. When flying alone, in order to couneract this, he flew continuously with one f the planes slightly warped.



View showing rear of seat, engine and tank on Wright aeroplane.

MORE ABOUT THE CONTROL.

The lever at the right has a double notion, that from side to side moving a mall upright arm A at the end of a tube. Vires from the tip of this arm pass hrough small pulleys and connect with ne wing tips, and it is by this means hat the surfaces of the planes are warped, ne upright supports being pivotally attach-l to the main frame of the upper and wer planes. This same lever when vung forward or backward controls a nall pivoted bar similar to an automobile rake evener, or a swingle-tree, and from ne ends of this, wires are carried to the ear vertical rudders so that they can e moved. In this way the upward or ownward motion of the horizontal rudder, ne warping of the wings, and the rear udder are all controlled by two simple vers, either of which will remain in calm

the speed varies between eight or nine hundred to fifteen hundred revolutions per minute.

SUBSTANTIAL CONSTRUCTION.

One of the noticeable features of the Wright aeroplane is its substantial construction. No bamboo poles whatever are used, and some of the bars are apparently 2x3 inches in section. All are made of spruce, the flexibility of which was clearly shown when we were discussing the front elevator, one of the vertical supports between the surfaces of which being slightly bent, he took hold of it and bent it in another direction three or four inches to straighten it up. These little rods were not over ¼x⅝ inch in cross section, and the proportioning of the parts throughout showed great skill.

When the larger supporting surface of his planes as compared to those of the Curtiss machine was mentioned, he said, "This is of entirely a different class. We do not go in for racing, this is a machine for service." To illustrate this point, he spoke of his trial flight made the previous evening around the island. "When I was about to land a group of photographers were standing right in the way, and this made it necessary for me to come down at pivot landing on the skids sidewise," but he said, "You see I did not damage anything in the least, although the strain was very great, and would have wrecked a machine of lighter construction."

WARPING THE FRONT RUDDER.

A feature in connection with the horizontal rudders which is not generally known is the fact that they present a concave surface to the wind not only on their under side, but likewise on their upper side. This is accomplished by a skillful arrangement of pivots so that when the surface is tipped downward, the planes are automatically warped so that they are concave on the upper side, giving a very much more decided and effective action than would be possible with flat planes, or if they presented a convex surface to the air. I noticed that steel wires instead of cables were used, and in speaking of them when questioned, he remarked that he didn't know but what cables might be better, but he had thoroughly tested what he was using, and had found it all right, and he hated to make any change. This is very typical of the man. He also said, against the use of cable that at its point of fastening, where it doubles back upon itself, it had to be soldered, thus making it virtually a solid wire, and that just at the end of the soldered portion, individual wires might break, very materially weakening it.

Throughout the construction wherever the wires passed over pulleys they were cut, and a small section of every light weight bicycle chain inserted so that there would be no chance for the wires being broken by continual bending over a pulley, and thus to the minutest detail of the fastenings the greatest care was shown. In one place a small coiled spring was inserted in one of the wires to give a desired flexibility, but a light weight slack chain connected the ends of the severed wire, limiting the spring motion, and standing in readiness to take the strain if the spring should snap.

The propellers themselves are about the height of a man; have two blades, and are made of wood, those on the particular machine in question being covered with aluminum paint. There are two of these propellers, just to the rear of the main planes, and revolve towards each other or in opposite directions, one being driven by an open chain and the other by a crossed chain.

The surfaces of the planes are covered with a light cotton duck which is not even water proof, but is stretched very tightly. There are two layers of this fabric, one stretched on the upper side of the ribs forming the plane and another sheet on the under side, this arrangement causing much less wind resistance as there are no pockets. Mr. Wright stated that with a single layer while flying in damp weather while in France, the cotton which had been newly stretched, became so baggy that it lifted several inches off the ribs, and, of course, the machine did not operate as accurately under these conditions. After that experience a double surface was used.

SEATING ARRANGEMENTS.

There are two seats, or what answer for seats. One has a thin board for a back, the front of which is slightly cushioned with corduroy. This is held in an upright position by a slight stick from the middle of the back, as shown in Fig. 2 at x. The other seat which is close beside the engine consists simply of a little corduroy pad on a thin board resting on the upper side of the ribs of the lower plane. A cross rod between the skids answers for a foot rest. A very unobstructed view of the country ahead can be had from either of the seats.

THE ENGINE.

There is not much to be said concerning the details of the engine other than that it is a regulation four-cylinder motor with fly wheel at the rear. At the forward end at the left driven by exposed gears is a high tension magneto, and a small gear pump which takes care of the water circulation. No exhaust pipes or mufflers are used. The cylinders are four by four with valves in the head, and the motor weighs in the neighborhood of two hundred pounds. The entire machine weighs about seven hundred pounds, and as far as actual lifting power is concerned could undoubtedly carry quite a number of people, although, of course, it is not arranged for more than two. A switch is conveniently located so that the ignition can be instantly cut off if desired.

CHANGES IN GOVERNMENT MACHINE

The machine used by the Government has always had a tendency to move up and down when in flight showing lack of fore and aft stability, owing, as Mr. Wright says, to its being overpowered. An experiment was made, the upper plane of the forward biplane rudder being removed and placed at the rear just forward of the two vertical rear rudders. This plane was placed in this position and not intended to move, but simply to add to the stability. A test was made of the machine and it was found that it flew much more steadily, but the speed was impaired and its lifting power was also lessened. It has not yet been determined whether the changes will be allowed to stand.

The Aero Club of Hartford has been in corporated under the laws of Connecticut to "advance the science of aerial navigation."

onoplanes demonstrated their speed
instability in the test of models built
the aviation school of the West Side
ung Men's Christian Association, New
rk City, on Saturday, November 6th,
en the second contest for a cup given by
is R. Adams, of the Aeronautic Socie-
of New York was won by a youth in
ckerbockers, Wilson Marshall, Jr., with
aeroplane built according to his own
as. This wide awake youth is to be
n at the extreme left of the accompany-
photo. This machine, a monoplane
h a rubber band motor, made a flight
sixty-four feet and nine inches. There
e some twenty miniature aeroplanes en-
ed in the contest, but trial flights before
contest began eliminated half of them by
akage and a high wind that swept the
d bringing most of the machines to
ef.

Bleriot model made the next best
ht, sixty feet, but turned completely
r twice in making it. The largest of
machines, constructed on the lines of
Wright bi-plane, with modifications,
de a good steady flight of forty-eight
and five inches despite the wind. This
chine seemed to be somewhat underen-
ed. With a larger propeller and a bet-
motor, her owner says, this model
uld do very good flying.

Iost of the models were of the mono-
ne type and some of them were quite
icate. Further flights for the Adams
will probably be held indoors and
d distances are expected to be made.
ng Marshall has two "wings" on the
now, and it becomes his permanent
session if he wins it again.

Vilbur R. Kimball, president of the
ial Development Co. and secretary of

The class work consists of lectures and discussions, work in gas engine laboratories and actual demonstrations at testing grounds and aerodromes near New York.

HARTFORD AEROPLANE SPECIALTIES

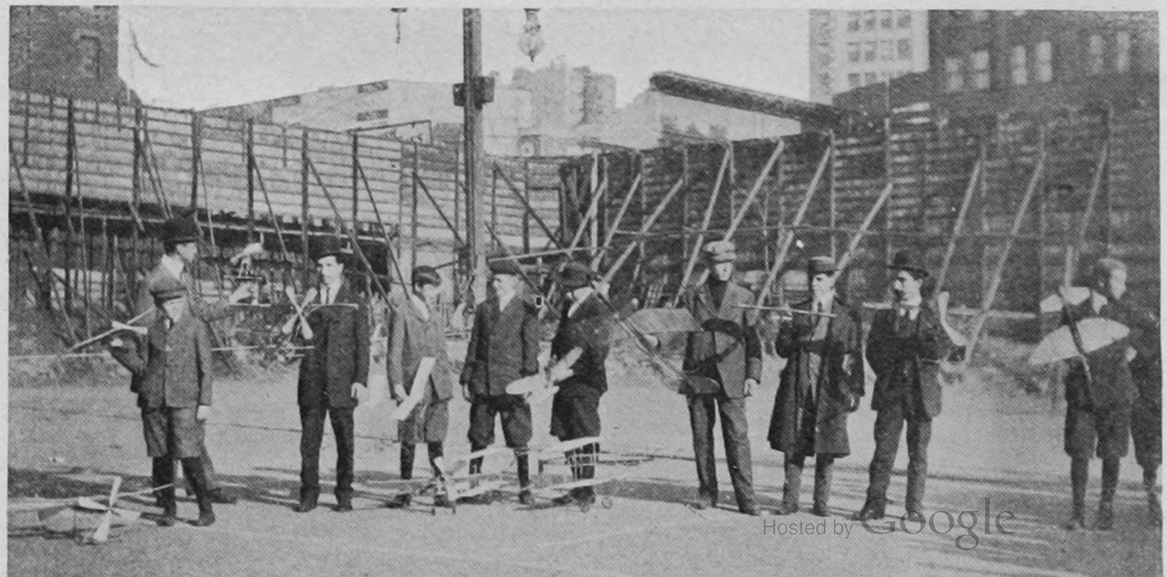
Owing to the increased experimental work in aeroplane construction, several automobile accessory manufacturers have taken up the manufacture of special aeroplane accessories which the average experimentor is unable to make himself.

HARTFORD AVIATOR
THE HARTFORD RUBBER WORKS CO. HARTFORD CONN. U.S.A.

The Hartford Aviator, 20x2 in. aeroplane tire.

Among these is the Hartford Rubber Co., of Hartford, Conn., who have added to their stock three sizes of aeroplane tires and an aero varnish for making fabrics gas-tight and water-proof, all of which are illustrated herewith.

The tires are made of pure para rubber which before entering the tire is put through a special process which strengthens it sufficiently for the road wear without detracting from its resiliency which has been developed to the highest point



HARTFORD AERONAUT
THE HARTFORD RUBBER WORKS CO. HARTFORD CONN. U.S.A.

The Hartford Aeronaut, 24x3 in. aeroplane tire.

HARTFORD AEROPLANE
THE HARTFORD RUBBER WORKS CO. HARTFORD CONN. U.S.A.

The Hartford Aeroplane, 26x2½ in. aeroplane tire.

to leave the earth their extraordinary bouncing qualities aid the car in rising.

ing 24x3 in. in size. The Hartford A
plane is 26x2½ in. in size and was pla
in stock in anticipation of the large
chines which in the near future are bo
to be the result of the present experim
al work.

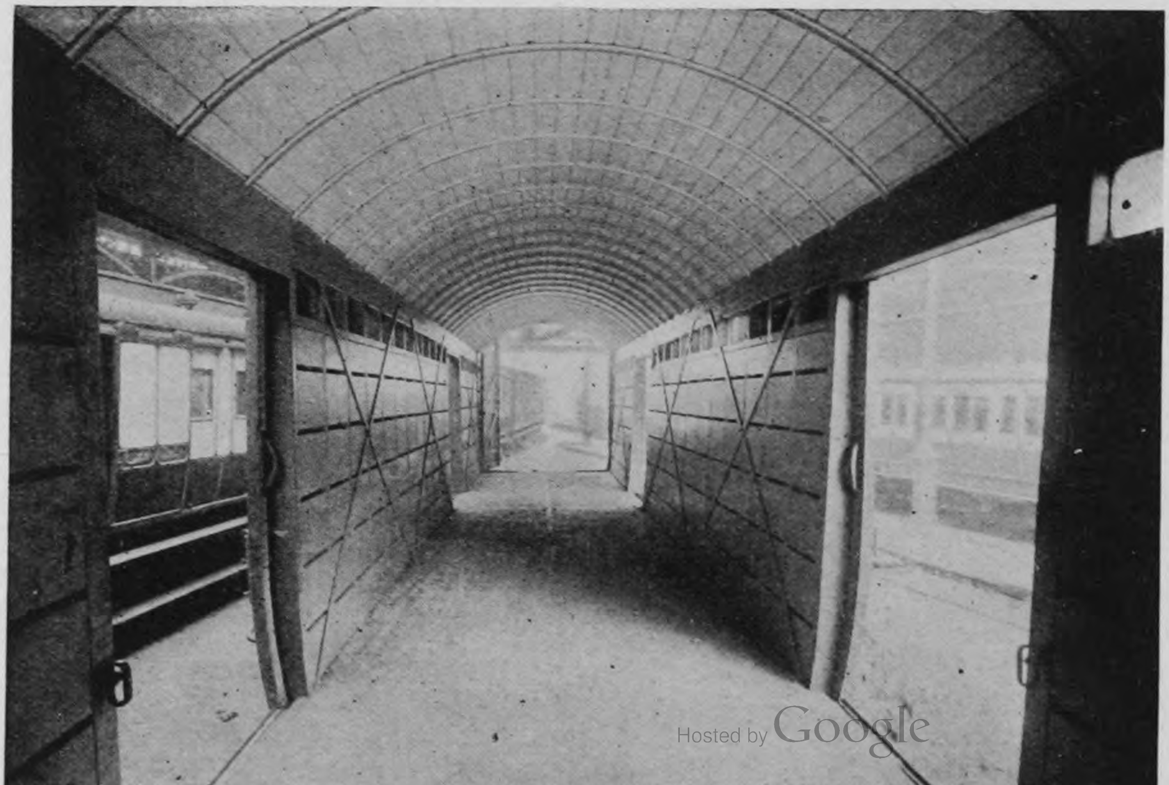
HARTFORD AERO VARNISH
MADE BY
HARTFORD RUBBER WO
FORD CONN. U

Hartford Aero Varnish

Tires of any size
weight will be m
special and the H
ford Co. solicits
correspondence
those interested in
gard to the prices
any special sizes o
the accessories he
with described.

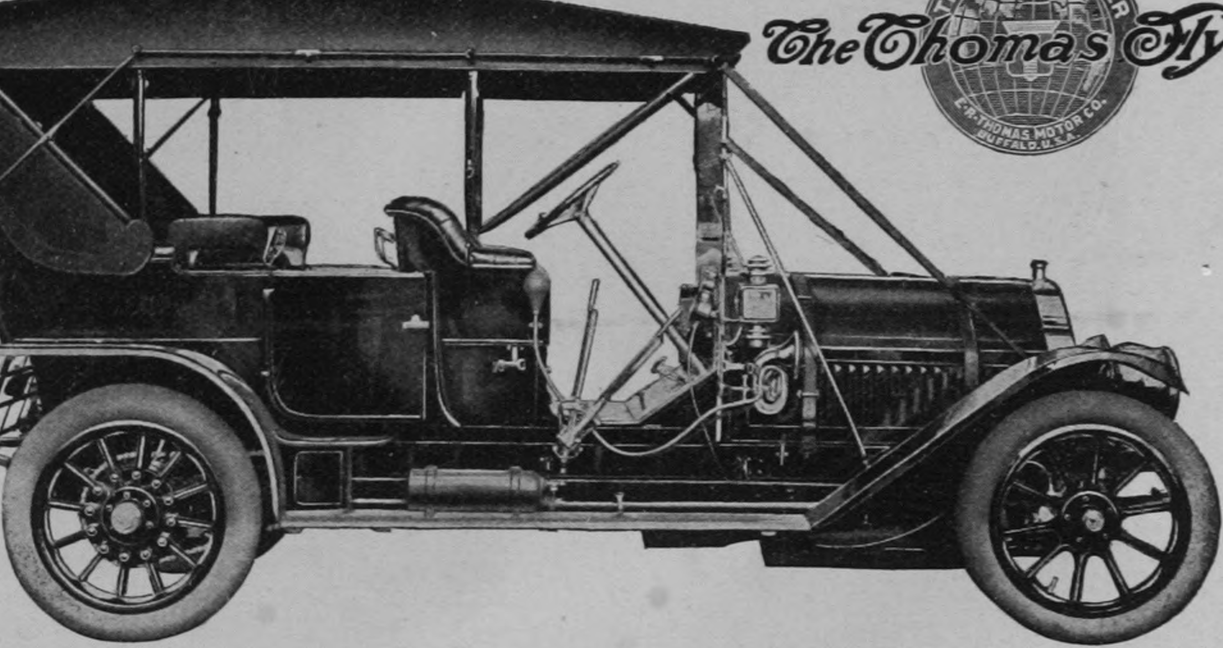
The Hartford A
Varnish is pure am
in color, is light an
claimed to make
fabric absolutely
tight and water-proof. It is not aff
ed by the elements and will not crack
soften in the heat nor become tough
scaley when exposed to the cold. T
varnish can be applied with equal succ
to any fabric used in envelope constr
tion. It is put up in gallon cans and b
rels.

An aeroplane factory is soon to be
tablished in Mount Vernon, N. Y., b
firm which recently purchased a la
tract at South Twelfth avenue and W
Third street.



The Thomas Flyer

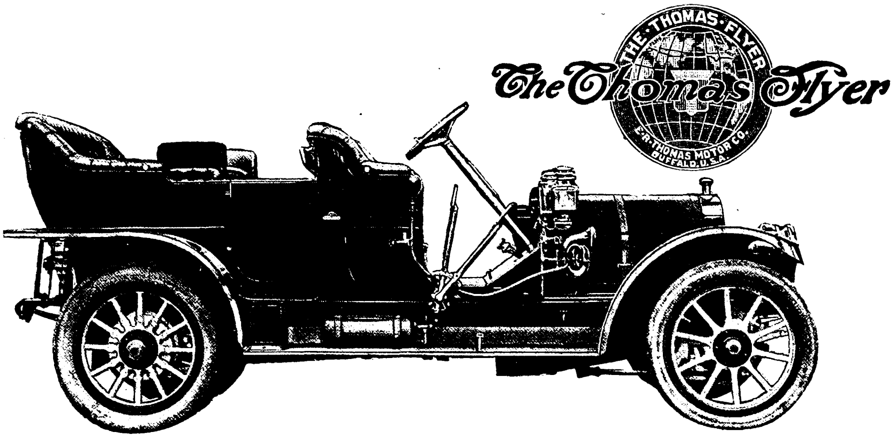
E.R. THOMAS MOTOR CO. BUFFALO, U.S.A.



Specifications of Thomas Flyer. Model "K" 6-70

1910 Model

Seating Capacity	Touring Car, Limousine and Landaulet, seven. Tourabout, three or four, depending upon whether single or double rumble seat is used. Flyabout, four.
Body	Hand-hammered Aluminum body, luxuriously upholstered.
Wheel Base	140 inches.
Tread	56 inches.
Motor	Six cylinders, four cycle, water cooled, cylinders cast separately. Seven separate bearings.
Horse Power	Seventy horse power.
Ignition	Two separate and distinct systems. Bosch high tension magneto and Atwater-Kent spark generator.
Lubrication	Mechanical ten-point oiler, feeds cylinders, crank case and chains. Transmission gears packed in grease; oil and grease cups are provided at all important bearings.
Control	Spark and throttle control above 18-inch steering wheel. Foot accelerator.
Transmission	Four speeds forward and reverse, selective type sliding gear. Direct drive on high gear. The countershaft is idle on direct drive.
Gear Ratio	Ratio of motor speed to that of the rear wheels is 2.6 to 1.
Clutch	Thomas three disc, cork inserts. Automatic clutch brake. Clutch interlocked with emergency brake lever.
Springs	Semi-elliptic front and rear. Rebound clip construction throughout.
Drive	Side chain with hardened drop-forged steel sprockets.
Bearings	Connecting rod and crank shaft, "Superior" babbitt. Seven large bearings. Cam shaft, "high-speed" bronze. Transmission, annular ball and roller. Countershaft, annular ball. Rear hub, annular ball. Steering gear, roller with ball thrust.
Brakes	Internal expanding on rear wheels. External contracting on countershaft. Extra large braking surface.
Cooling	Honeycomb Radiator. Gear Pump of large capacity. Large water passages. Cast Aluminum Fan.
Steering Gear	Adjustable worm and sector type. Eighteen-inch wheel.
Tires	Touring Car, Landaulet and Limousine, 38x4½ inches front; 38x5½ inches rear. Tourabout and Flyabout, 38x4½ inches front and rear. Detachable rims and Goodrich or Diamond tires are standard.
Speed	Five to seventy miles an hour on high gear.
Equipment	Glass front, top with electric dome light and parcel carrier, 100 mile speedometer with clock, shock absorbers, robe rail, tire irons, trunk rack, acetylene headlights, combination oil and electric side and tail lamps with storage battery, electric cigar lighter in tonneau, Prest-O-Lite tank.
Color	Landaulet and Limousine, maroon with olive gray upholstering. Tourabout, Flyabout and Touring Car, royal blue with straw color running gear or Thomas red with light red running gear.
Price	Touring Car, Flyabout, Tourabout, $6000 complete. Limousine, Landaulet, $7500.



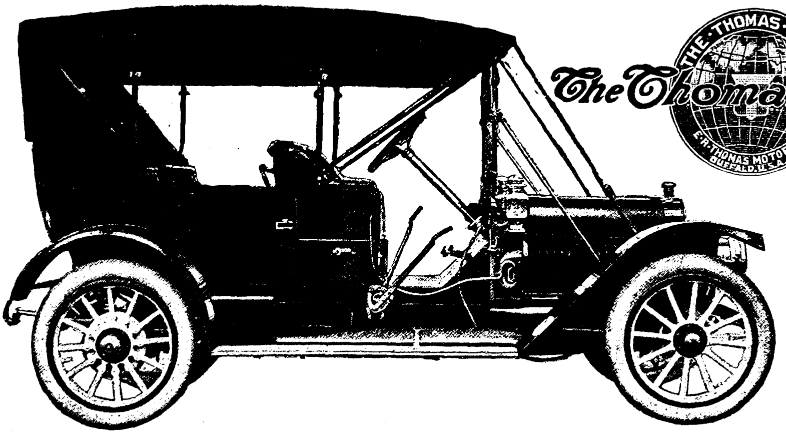
Specifications of Thomas Flyer. Model "F" 4-60

1910 Model

Seating Capacity	Landaulet, Limousine, Touring Car, seven. Tourabout, three or four, depending upon whether single or double rumble seat is used. Flyabout, four.
Body	Hand-hammered Aluminum body, luxuriously upholstered.
Wheel Base	127 inches.
Tread	56 inches.
Motor	Four cylinders, four cycle, water cooled, cylinders cast separately. Five separate bearings.
Horse Power	Sixty horse power.
Ignition	Two separate and distinct systems. Bosch high tension magneto and Atwater-Kent spark generator.
Lubrication	Mechanical eight-point oiler feeds cylinders, crank case and chains. Transmission gears packed in grease. Oil or grease cups at all important bearings.
Control	Spark and throttle control above 18-inch steering wheel. Foot accelerator.
Transmission	Four speeds forward and a reverse, sliding gear selective type. Direct drive on high gear. The countershaft is idle on direct drive.
Gear Ratio	Ratio of motor speed to that of rear wheel is 2.6 to 1.
Clutch	Thomas three disc with cork inserts. Automatic clutch brake. Clutch interlocked with emergency brake.
Springs	Semi-elliptic front and rear. Rebound clip construction throughout.
Drive	Side chain with hardened drop-forged steel sprockets.
Bearings	Connecting rods and crank shaft, "Superior" babbitt. Cam shaft, "high speed" bronze. Transmission, annular ball and roller. Countershaft, annular ball. Front hub bearings, roller. Rear hub, annular ball. Steering gear, roller with ball thrust.
Brakes	Internal expanding on rear wheels. External contracting on countershaft. Extra large braking surface.
Cooling	Honeycomb Radiator. Gear pump of large capacity. Large water passages. Cast Aluminum fan.
Steering Gear	Adjustable worm and sector type. Eighteen inch wheel.
Tires	Landaulet, Limousine and Touring Car, 36x4½ inches front, 36x5 inches rear. Tourabout and Flyabout, 36x4½ inches front, 36x4½ inches rear. Detachable rims and Goodrich or Diamond tires are standard.
Speed	Five to sixty miles an hour on high gear.
Equipment	Combination oil and electric side and tail lamps with storage battery, acetylene headlights, horn, coat rack, trunk rack, tire irons, Prest-O-Lite tank and shock absorbers.
Color	Landaulet and Limousine, maroon with olive gray upholstering. Tourabout, Flyabout and Touring Car, royal blue with straw color running gear or Thomas red with light red running gear.
Price	Touring Car, Flyabout, Tourabout, $4500. Limousine, Landaulet, $6000.

E. R. THOMAS MOTOR CO., Buffalo, U.S.A.

Licensed under Selden Patent



The Thomas Flyer

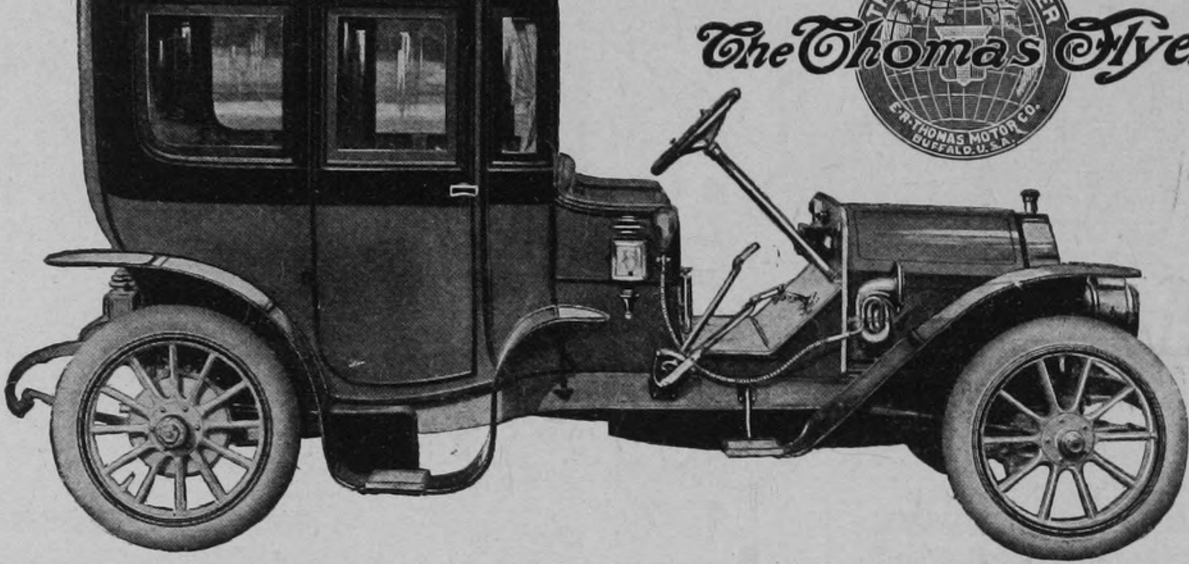
Specifications of Thomas Flyer. Model "M" 6-40

1910 Model

Seating Capacity	Touring Car, five. Combination Car (including features of Runabout, Tourabout and Flyabout), three and four. Runabout, three or four. Tourabout and Flyabout, four. Limousine and Landaulet, seven.
Body	Hand-hammered Aluminum, luxuriously upholstered.
Wheel Base	125 inches.
Tread	56 inches.
Motor	Six cylinder, four cycle, water cooled, cylinders cast in pairs. 4¼-inch bore by 5½-inch stroke.
Horse Power	Forty horse power. (43.8 A. L. A. M. rating.)
Ignition	Two separate and distinct systems. Bosch high tension magneto and Atwater-Kent unisparker with battery.
Lubrication	Mechanical oiler with sight feed on dashboard. Transmission gears packed in grease. Oil or grease cups at all important bearings.
Control	Spark and throttle control above 18-inch steering wheel. Foot accelerator.
Transmission	Three speeds forward and a reverse, selective type sliding gear. Direct drive on high gear.
Gear Ratio	Three to one.
Clutch	Thomas three disc with cork inserts, enclosed in oil-tight case. Automatic clutch brake.
Springs	Semi-elliptic front. Three-quarter elliptic rear. Rebound clip construction throughout.
Drive	Shaft drive. Bevel gears in oil-tight case.
Bearings	Crank shaft and connecting rods, best die cast babbitt. Cam shaft, phosphor bronze. Transmission, annular ball. Front and rear hubs, Timken roller. Steering gear, roller with ball thrust.
Brakes	Internal and external on rear wheels. Unusually large braking surface.
Cooling	Honeycomb radiator. Centrifugal pump. Large water passages. Belt driven fan of cast aluminum.
Steering Gear	Adjustable worm and sector type.
Tires	Goodrich or Diamond tires. Quick Detachable rims. 36x4½-inch front and rear on Touring Car, Flyabout and Runabout. 36x4½-inch front and 37x5-inch rear on Limousine and Landaulet.
Speed	Five to fifty-five miles per hour on direct drive.
Equipment	Top, glass front, speedometer, shock absorbers, head, side and tail lamps, horn, robe rail, tire irons, Prest-O-Lite tank.
Color	Landaulet and Limousine, maroon with French gray worsted upholstering. Touring Car, Combination Car, Runabout, Tourabout and Flyabout, royal blue with straw color running gear or Thomas red with light red running gear.
Price	Touring Car, Flyabout, Tourabout, $3500 complete. Limousine, $5000. Landaulet, $5150.

E. R. THOMAS MOTOR CO., Buffalo, U.S.A.

Licensed under Selden Patent


The Thomas Flye
E·R·THOMAS MOTOR CO.
BUFFALO, U.S.A.

Specifications of Thomas Town Car. Model "R" 4-28

1910 Model

Seating Capacity	Six. Four passengers inside.
Body	Hand-hammered Aluminum upholstered in imported worsted or broad cloth; morocco optional. Luxurious, deep cushions. Patent leathe fenders.
Wheel Base	123 inches.
Tread	56 inches.
Motor	Four cylinders, four cycle, water cooled, cylinders cast in pairs 4¼-inc bore by 5½-inch stroke.
Horse Power	Twenty-eight horse power (28.9 A. L. A. M. rating.)
Ignition	Two separate and distinct systems. Bosch high tension magneto an Atwater-Kent unisparker with battery.
Lubrication	Mechanical oiler with sight feed on dashboard. Transmission gear packed in grease. Oil or grease cups at all important bearings.
Control	Spark and throttle control above 18-inch steering wheel. Foot accelerato
Transmission	Three speeds forward and a reverse, selective type sliding gear. Direc drive on high gear.
Gear Ratio	Three to one.
Clutch	Thomas three disc with cork inserts enclosed in oil-tight case. Automatic clutch brake.
Springs	Semi-elliptic front. Three-quarter elliptic rear. Rebound clip construction throughout.
Drive	Shaft drive. Bevel gears in oil-tight case.
Bearings	Crank shaft and connecting rods, best die cast babbitt. Cam shaft phosphor bronze. Transmission, annular ball. Front and rear hubs Timken roller. Steering gear, roller with ball thrust.
Brakes	Internal and external on rear wheels. Unusually large braking surface.
Cooling	Honeycomb radiator. Centrifugal pump. Large water passages. Bel driven fan of cast aluminum.
Steering Gear	Adjustable worm and sector type.
Tires	Goodrich or Diamond tires. 34x4½-inch front and rear. Quick Detachabl rims.
Speed	Five to forty-five miles per hour on direct drive.
Equipment	Head, side and tail lamps, horn, tire irons, Prest-O-Lite tank.
Color	Brilliant blue with black trimmings and azure blue running gear. Blac upholstering on front seat. French gray worsted interior.
Price	Brougham, $4000. Limousine, $4100. Landaulet, $4250.

otors. It is manufactured by the Indian efining Co., Inc., Cincinnati, Ohio.

This oil is particularly free from any ee or uncombined carbon which would use deposit in the engine, thereby caus- g missings in the explosions. It is filred as finely as it is possible to filter l, and is made from a selected and seted neutral stock. It combines great bricating and wearing qualities with oper cold tests as well as fire tests, and is claimed will stand up under any strain is put to in gas engine lubrication.

In France, it is estimated by a good nancial authority, $1,250,000 is invested in erial machine manufacture, and of this m $750,000 is devoted to the making of rigible balloons. This amount can be eatly augmented by the manufacture of otors. There are, besides, a large num- r of subsidiary and dependent industries fected.

LATHAM MAKES NEW ALTITUDE RECORD

On November 19 at, the aerodrome near alons, France, Latham, in an Antionette onoplane, flew in a strong wind to a eight of 1350 feet, establishing a new cord. About 3 months ago Orville right flew 1600 feet in the air, but no ficial measurement was made.

Although the wind at times was blow- g at about 30 miles an hour. Latham ade several flights, as also did Paulhan, ose greatest height in his Farman ma- ine was about 1210 feet. The speeds at-

of being the first woman aviator. She recently made a flight of 300 yards alone at the Chalons camp (France) on a Voison biplane.

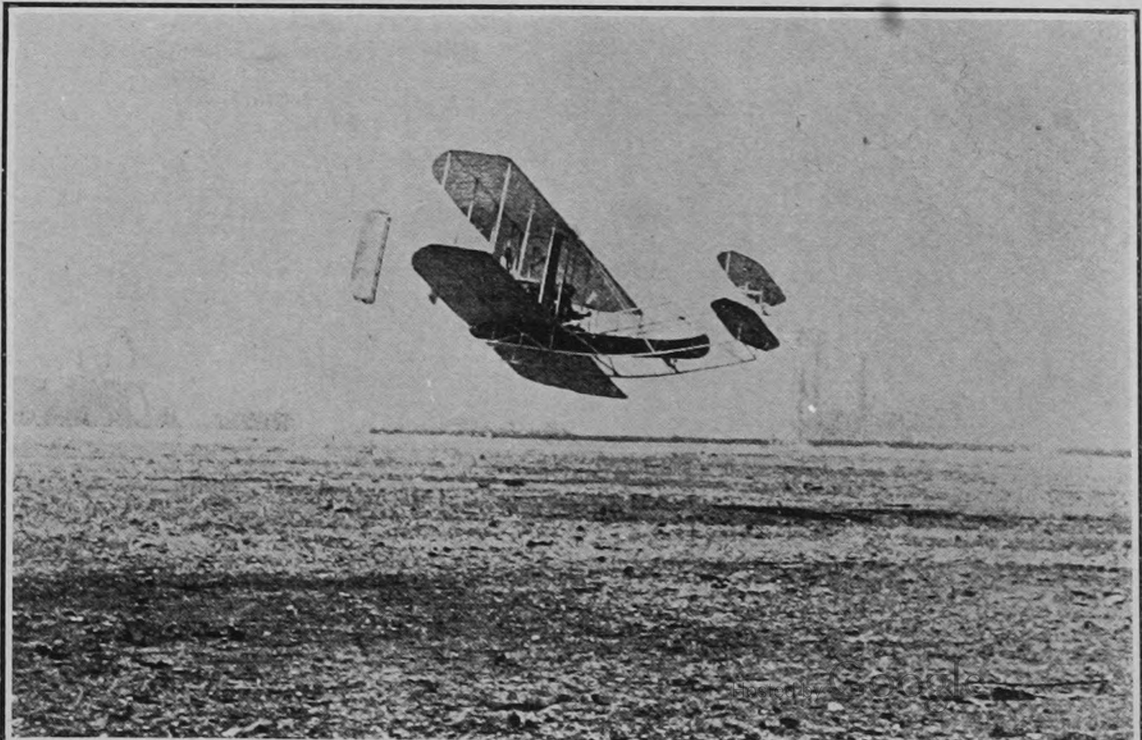
Fleis Equipment Company, Brooklyn, N. Y., was recently incorporated by Charles E. Miller, B. W. D. Woodward, George Bender, W. A. Towner, Jr., and John P. Miller, with a capital of $100,000, to manufacture airships, aeroplanes and balloons.

Boston is preparing for the First National Aeronautic Exposition, to be held in that city next spring. Every type of air craft will be exhibited, there will be lectures, demonstrations and discussions, and many distinguished visitors. Chester I. Campbell will have charge of the show and Charles J. Glidden is chairman of the Executive Committee. On the Advisory Board are Glenn H. Curtiss, Orville and Wilbur Wright, and Prof. W. H. Pickering, of Amherst.

AEROPLANES IN WAR

The difficulty of seeing an aeroplane at any distance was shown at the Rheims meet, as it was almost impossible to see the machines when rounding the turn at the farther end of the field. That they will be very difficult marks to hit during war time has been amply demonstrated.

Hiram Maxim, the well-known inventor of explosives and guns, recently made the statement that wars of the future will be largely decided by the number and efficiency of the aeroplanes employed, not as droppers of explosives but as scouts and destroyers of bridges.



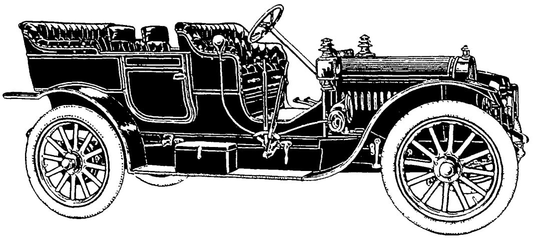
What Reliability Really Means

Magnificently Exemplified by the

Elmore

Model 36
36 H. P.
5 Passenger, 4 Cyl. Touring Car
4 Passenger, 4 Cyl. Demi-Tonneau
Landaulet and Doctor's Coupe

Model 46
46 H. P.
7 Passenger, 4 Cyl. Touring Car
7 Passenger, 4 Cyl. Limousine



The Frank A. Munsey Run from Washington to Boston and return was valuable because it gave spectacular prominence to a vital fact which has been familiar for years to four or five thousand Elmore owners.

Every man who owns a valveless two cycle Elmore knows that his car, **precisely because** it has a two cycle engine, giving double the number of power impulses of a four cycle engine, and **because** it has no valves, possesses greater powers of reliability and endurance than any other in the world.

He knows that without replacement of any sort (because there is nothing to replace) his engine will be exactly as efficient two years after he buys it as the day it left the factory.

Can you conceive any two-year-old four cycle car which has traveled 20,000 miles, being entered without replacement or repair, in the severest reliability run of the season?

Can you imagine any four cycle car being as good, at the end of two such strenuous years (and at the conclusion of such a contest) as the day it left the factory—unless its internal mechanism had been constantly nursed, or unless the valves or some other vital parts had been adjusted or renewed?

Assuredly not—and for that reason the results of the Frank A. Munsey reliability run are worthy of serious study.

The fact that the Elmore car was awarded the prize in its division, and also the sweepstakes trophy over all other entrants in all classes, is not the important point.

The important thing for you to know is the fact that this Elmore car was a two-year-old model; that it was driven by an amateur (the son of the owner); that there was no stripping or tuning or special preparation; that it competed with 44 of the finest cars in the country, selling up to $5000; and that it was the only one of the 44 which passed the rigid scrutiny of the judges with an absolutely perfect score.

Some of the other cars had charged against them as many as 5000 points.

None of them, save the Elmore—this two-year-old car, with a touring record of 20,000 miles—was pronounced as sound and perfect at the close of the run as at the start.

The car covered in all 1282.2 miles, or an average of 183.1 miles per day on a 20 mile per hour schedule.

The second day's run included at least 50 miles of mountainous and hilly country; the third day covered the worst route the committee could find, through and over the Catskill mountains, most of it in a pouring rain; the fourth day took the car through the Berkshire hills; the sixth through continuous sand and mud; and the seventh and eighth in pouring rain and over roads so dangerously slippery that chains were called into commission.

We have no desire to lay special stress upon the triumph of the Elmore in this run except, as we have said, as it gives widespread dissemination to fundamental facts which are a matter of common knowledge to Elmore owners.

A great deal of the success of the car (in this instance) was due to careful driving; but the element of reliability which was evidenced is possessed in the same high degree by every Elmore car which leaves the factory and every Elmore car driven in this country today.

Why?

Just because the Elmore embodies the two cycle principle — which means in the fewest possible words, a continuous, unbroken flow of power — which no four cycle car can give you.

Second, because the Elmore engine has no valves — no parts to be replaced or adjusted.

Third and finally because it is the simplest and therefore the surest and longest-lived engine in the world.

Isn't it high time that you advised yourself more fully concerning the vital facts deduced by this remarkable run?

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MECHANICAL AND TECHNICAL DEPARTMENT

EDITORS

Gasoline vehicles—Chas. E. Duryea, Reading, Pa., Consulting Engineer, A. M. C M. A.
Two-Cycle Engines—Hugh Dolnar.

REGULATIONS OF THIS DEPARTMENT

We are pleased at all times to answer the questions of our readers and also grant full use of these columns to those who disagree with what is expressed herein, but we insist upon the following simple rules being adhered to.

1. Plain writing, on one side of the paper only. Typewriting preferred.
2. Letters should be addressed to the Editor for whom they are intended, care Cycle & Automobile Trade Journal.
3. Questions will not be answered unless bearing sender's name and address. These, however, will not be published if so requested.
4. Questions should be clearly stated, without tedious preamble and should reach Philadelphia by the 5th of the month to be answered in the following issue.
5. Answers not for publication should not be expected by mail without remuneration.
6. For Motorcycle Answers see Motorcycle Department.

TO INSURE AN ANSWER

In spite of the announcement at the head of this Department that inquiries will not be answered unless accompanied by the name and address of the inquirer, we still receive inquiries without the name and address. We have one signed "A Subscriber," Richmond, Ind., and one "Your Reader," Newark, N. Y. We will not publish the name of the inquirer, if requested not to, but must have his name and address for reference.

BETTER LET VALVES ALONE

I have two engines I have been overhauling, one a 4-cylinder, 7x6-inch, 4-cycle engine with valves in head, inlet automatic. This is a high speed marine engine and owner wants inlet valve changed to be mechanically operated, also valve to be made different from present valve. This present valve has a row of holes drilled all way around it near the circumference. Owner wants a new cage and valve made without holes. This valve sets in a flat surface and where the holes are the valve seat has a groove on it; valve is 2¾-inch diameter and ½-inch lift. What is the object of the holes in valve, is it for lightness and to give it greater opening area? This is a French make and develops 100 H. P. at 1000 revolutions, has worked fine for two years and my advice to owner is to let it alone. Would he gain anything by a mechanical operated inlet?

The other is an 8-cylinder, 4-cycle engine built for a flying machine. This is a V-type of motor, but vibrates badly, which I believe is due to the way the cylinders fire. I have weighed the pistons and rods and they all weigh the same to a fraction. Fly wheel is balanced and there are only bearings on crank shaft, and each crank pin carries 4 connection rods. This is a good stout crank shaft and is true in the lathe. The firing order of the cylinders on the right, starting from the front is 7, 1, 5, 3, and those on the left is 2, 6, 4, 8. Would I get better results if I timed the engine so as to fire on the right in 7, 3, 5, 1 order and on the left in 2, 6, 4, 8 order, or does this V-type of 8-cylinder motor vibrate at high speed? The compression in this motor is 70 lbs. and each cylinder is nearly equal and all the valves are timed correctly. Would the way the pistons are hung on the chank shaft have anything to do with it?

VALLEY STREAM, N. Y. J. C. SMITH.

My advice would be to let the valves alone. The holes are to let the gas get through faster. The valve as made by the maker is better than you will likely get without many trials. It is seldom possible to improve high grade work without a vast amount of experimenting. I do not believe in mechanically operated inlets. The inlet valves can be so light that they open with the lightest suction and so do not induce the power worth mentioning, but they will respond to the speed of the motor much better than a mechanically open valve can be made to do. I know this is not in accord with the opinions of many makers, but I believe it correct. Many makers strive for maximum power whereas the user wants much more that the engine should be flexible and give great torque at low and moderate speeds. The mechanical inlet which opens best for high speeds will often be found to be opening badly for lower speeds. The suction inlet if large and light will fit itself to the engine needs. It may slightly reduce the charges at high speeds, but it is much better at lower ones in my humble opinion. I think your 8-cylinder vibration is due to the fact that the shaft is but two throw. If you put a fly wheel on both ends of the shaft you will help it. The present firing, as I understand it, brings two ignitions together at one end of the shaft, whereas it would seem to be better to fire as you suggest and alternate the ignitions from one end to the other.—C. E. D.

WANTS ROUGH CASTINGS

[522.] I am a reader of your journal and wish to build a 4-cycle, 4-cylinder automobile motor of 50 to 60 H. P.

Could you kindly give me a list of automobile engine manufacturers who furnish castings in the rough?

PENN YAN, N. Y. C. B. S.

We refer you to the Motor Cycle, Motor Boat, and Automobile Trade Directory, published by us, which contains complete alphabetical lists of names of manufacturers of complete machines, accessories and parts.—ED.

COMPRESSIONLESS ENGINES.

[534.] 1. To the best of your knowledge, was there ever a gas engine made that ran without compression?

2. Is so, how was it done?

3. What is your reflection on an engine that has no compression in the cylinder. The gas not entering until the piston has reached the top of the cylinder prior to explosion. The gasoline being taken from supply tank flowing by gravity to patent gas mixer, mounted on the dash in plain view, after the gas is formed, it is sucked to pump and compressed to 100 pounds per square inch, is admitted to cyinder by rotary valve.

SACRAMENTO, CAL. H. A. PAYTON.

The old Lenoir engine ran without compression. So did the Otto and Langen flying piston engine. So does the little Paradox engine for sale at the toy stores. In the Lenoir, the piston movement sucks in mixture for about one-third of the stroke, then the spark fires this and its expansion drives the piston to the end of the stroke where the exhaust valve lets out the burned gas and remains open to the end of the exhaust stroke. There is no firing chamber so the exhaust is complete like a steam engine. The action is repeated on the next stroke thus making a 2-cycle engine. The device you propose would substitute a pump to suck and compress instead of the suction portion of the stroke described. It will work, but the losses in the pump will be greater than to make the engine piston do its own compressing as in the regular types now in use. It will not be worth while to work along the line you propose unless there is some object in your view which does not appear to me.—C. E. D.

GAINING MORE POWER

[536.] Would there be any power gained if I connect an exhaust fan to exhaust? If so, would it take all power gained to run far or would there be any power left over?

I am going to experiment with special cams. My object is to keep valves opened up the same distance during stroke and letting them close suddenly. Is this plan a good one?

JERSEY CITY, N. J. OSCAR TAYLOR.

There is very little to be gained by putting a fan or turbine in the exhaust. After the gases have been alowed to expand they have but little energy left. The expansion loses it. If they can be made to work as they expand there is some power to be gained. It is because of this fact that the compound gas engine attracts some people. Prof. Denton reports a test of a compound engine formerly built in Connecticut which showed a gain of about 20 per cent. in economy over the same engine when run as a non-compound. In this latter case it would have the large piston friction as a loss over the usual form. The exhaust has been used to run a magneto, but such practice has not been common. If much power is to be taken from the exhaust the back pressure on the engine becomes objectionable and it is better practice to keep the exhaust free and get the power from the usual source. I have used your cam shapes for years, but just the reverse of the way you propose. There is no gain in sudden closing. There is very little gas to escape as the piston nears the end of the exhaust stroke so the valves may as well be let down easily. This saves noise and does not hammer the valve heads off. But they cannot be opened too suddenly. With a quick opening they need not open so early so the gas gets a longer time to do its work with gain in power. They also get out of the way of the hot gases and so keep cooler. I used offset cam shafts to get quicker opening action and note that some others are at last following this practice.—C. E. D.

TIMING AND TEMPERING

[539.] Being a steady reader of the Cycle and Auto Trade Journal, I would kindly ask you for the following information:

What is the correct timing of a motor's valves? How do you temper chisels and punches? What color for a hammer?

PITTSBURG, PA. "L. V. D."

Usually the exhaust valve should open 25 to 40 degrees ahead of bottom dead center and close at top center. The inlet should open immediately after and close at bottom center. The spark should snap at top center for starting and something ahead of speed. The amount of lead is usually a matter of test. Tempering is an art which can hardly be learned by mail. Its success depends much on the steel used. The maker of the steel can tell you best the colors or temperatures to be used. In general heat it hot enough to be sure to harden. Usually a good red heat will suffice. Cool suddenly and it will be found glass hard. Then heat till it takes a straw color for a hammer and let the colors change until blue for punch or chisel then quench. In the smaller tools it is usual to only chill the point and brighten it on a brick while the color runs down from the hot portion above.—C. E. D.

INTENDS TO BUILD ENGINE

[540.] Would you kindly inform me through your valuable paper what you think of an engine I intend to build. The dimensions are as follows:

1. Bore 2⅝ inches by 3½-inch stroke.
2. Speed 2500 to 2800 R. P. M.
3. Compression 70 lbs. per square inch.
4. Compression (crank case) 3 to 4 lbs. per square inch.
5. Inlet ⅜ inches by 90 degrees clear opening with one bridge in center. Area equals .768 plus sq. inch.
6. Exhaust ⅝ by 90 degrees clear opening with one bridge in center. Area equals 1.28 plus sq. inch.
7. Lower edge of inlet port on line with lower edge of exhaust port.
8. Flywheel 6 inches diameter, 1½ face, 15 lbs.
9. Carburetor 1 inch.

I consider your Journal to be the best of all and exceedingly instructive.

CHICAGO, ILL. F. W. VODOZ.

Your engine will not give the speed you think. The crank case compression should be higher. Eight pounds is not too much for the speed wanted. Your ports should also be larger. Nine-sixteenths inches and ⅞ inches is not too much for the speed wanted. Much depends on the make of carburetor, but I feel sure the 1-inch size is too large for good results at slow and moderate speeds. With three port design it will serve at high speeds. In fact, with the three port design it is hardly possible to get the carburetor and pipes and ports too large for high speeds. You will also gain in speed by making the ports more than 90 degrees. This cuts down the distance between port ends and increases the loss by leakage around the piston from one port to the other, but careful fitting of the piston will save much of this loss.—C. E. D.

DOES HOT ENGINE AFFECT COMPRESSION.

[541.] Knowing that you are in the habit of answering queries regarding automobiles in general, I have been asked to write you regarding the compression of an automobile engine. A question arose as to whether the compression of an engine was greater when the engine was cold than when under running conditions. By this I mean that in the first case, the engine is absolutely cold, not having been run for at least 24 hours; in the second case, the engine is hot after having been run for a few hours or better when the engine is running. Which, in your estimation, will show the higher compression, assuming no leakage at all.

NEWARK, N. J. WALDO GEO. GERNANDT.

Under your conditions the hot engine will show the highest compression. Compressing anything heats it. If the engine is cold this heat passes into the walls and the pressure gauge will not show so high. But if the walls are hot the heat cannot get away so fast so the pressure shows higher. If the walls are very hot, the heat of the walls may heat the charge and raise the pressure above what it should properly show. The proper way to get the actual compression is to have a gauge showing maximum pressure on one cylinder, whlie the other runs the engine. Cut off the spark and turn on the gauge when the engine is hot and in normal condition.—C. E. D.

THE HOLSMAN SCOTCH YOKE

[542.] Will you kindly explain how the motion of the piston is transmitted to the crank shaft in the Holsman 4-cylinder engine? We have their catalogue showing cut of the double piston, but we can not understand how the crank pin can get its vertical motion when it is through the roller bearing in the piston. Also how are their exhaust valves operated without gears? Their catalog tells of these points, but does not explain them. We believe this would be of interest to a number of your readers.

MONTEZUMA, IND. JOURNAL READER.

The Holsman arrangement is a very ingenious device. It is a modification of the cross head or slide commonly known as a "Scotch yoke." The "Scotch yoke" is found on many fire engines where the pump piston is connected to the engine piston and where to secure compactness it is not desirable to use a connecting rod. Instead there is provided a slide way across the axis of the piston rods. In this slideway or yoke there is a square block or slide with a hole through it for the crank pin. As the crank revolves the pistons move in one direction and the slide moves across the yoke and back. The fault of the device is its friction and tendency to wear more in the middle than at the ends. Holsman puts an annular bearing on the crank pin. The outer ring of this could roll on the yoke and give fair results as was done in the Bailey 2-cycle some years ago, but Holsman does it better. Instead of the slide or yoke of the usual construction he has much room between the yoke surfaces and fills this by inserting two wheel segments. The hub parts of these partly encircle the ball bearing and the rim parts roll on the yoke surfaces. There is a slight sliding movement on the ball bearing ring, but very little as compared to the sliding of the usual "Scotch yoke." The rim parts are held in place on the yoke so they cannot get off by a few guide pins like small sprocket teeth. These do not work except to simply insure the position of the parts. The pistons are held in line and together by rods which are adjustable. The segments and bearing fill the space between. If any lost motion comes from long use the pistons can be brought slightly closer together. It seems to me like a very practical arrangement.

The exhaust lifting arrangement did not impress me so as to fix itself on my memory. It is an arrangement much like Otto used in the early days. The early Daimler engines used a similar device. Gears are cheaper to build and better usually so most engine makers prefer to use the gears, but in an opposed engine like the Holsman there may be good reason for preferring the cam-like path instead. The Daimler device was a groove in the side of the fly wheel. The valve lifter was close to the fly wheel and parallel to the face thereof. On the lifter end was a shoe which followed the groove. During one revolution the shoe followed the inner circle of the groove, while in the next it followed the outer one. Part of this outer curve was of sufficiently large diameter to lift the lifter into contact with the exhaust valve and open it. The stroke of the engine is very short. That part of the shaft which carries the annular bearing is much larger than the portions each side of it and is narrow enough to pass between the parts of the pistons which have the bolt lugs. The outer ring of the bearing can protrude at each side as the shaft revolves. The space in the center of the piston parts, does not seem to be sufficient for the rocking segments which I have just described. It would seem that in the construction the outer ring of the bearing simply rolled on the piston casting just as in the Bailey construction mentioned.—C. E. D.

FOR THE BEGINNER

[543.] Being a reader of your journal I would be pleased to have you answer the following questions:

1. What is meant by a live and dead axle?
2. What is meant by crank case compression?
3. What is a planetary transmission?
4. What is the difference between a 2-cycle and a 4-cycle engine?

CLEVELAND, O. G. H. ADAMS.

A live axle is one which turns with the wheels, and carries the load. A floating axle is a live axle and turns the wheels, but the wheels run on dead stubs or ends of tubes and carry the load so the axle has no load. A dead axle does not turn at all. The usual carriage or wagon axle is dead. The advantage of the dead type over the ordinary live axle is that it is not subjected to strain in first one direction and then the other. This alternating stress is what breaks axles as well as other things. Metal in particular requires but little to bend it out of straight, but as soon as its particles get under tension its stiffness becomes apparent. The dead axle is usually set so its spring lets the wheels come into proper position. The live axles must be straight and the spring of the axle throws the tops of the wheels together a little. In 2-cycle engines charges are drawn into the crank case and the downward stroke of its piston compresses it. This is crank case compression. The 4-cycle engine sucks the new charge into the cylinder and compresses it there. But this takes a revolution if the crank shaft which is idle and which does not give power. In the 2-cycle engine there are no idle strokes, the piston's upward movement draws the new charge into the crank case and its downward movement compresses it there. When the exhaust port and transfer port get into their respective open positions, the charge transfers into the cylinder. It would not do this if it was not under compression in the case. This transfer allows the engine to fire and work at each revolution of the shaft with no idle revolutions. A 2-cycle engine fires every down stroke of the piston and compresses the charge in the cylinder on the up stroke, making one firing to every two strokes of the piston. The 4-cycle piston draws in a charge on the down stroke, compresses it on the up stroke, fires on the next down stroke and forces out the burned gas in the next up stroke, four strokes to one firing, hence 4-cycle. A planetary transmission is one in which the gears for the speed changes revolve around the main shaft. In most other transmissions the gears simply turn on their axes. In the planetary they not only do this, but as a planet revolves around its sun they travel around the central gears or shaft. Most of them give a direct drive with no gears in action, but with the whole device turning with the engine shaft just as so much additional fly wheel.—C. E. D.

ARE HAND VULCANIZERS PRACTICAL?

[544.] Are vulcanizers, as found on the market, practical for the general automobilist? Would you advise an automobile owner to purchase a vulcanizer for his own use in repairing tubes and casings? What would be the objection to using coal oil in the radiator for keeping cylinders cool during the winter season? Has it ever been tried?

McPHERSON, KANS. J. C. HALL.

If the operator has the time to spare and will use the vulcanizer it is a valuable tool. The time to fix a tire is at once after it gets damaged. Where the rubber is cut or lifted down to the fabric it should be vulcanized. If it is not the water soaks into the fabric and rots it with the result that there will, in a short time, be a burst casing at that point. Then the repair is beyond the usual owner and the tire must go to the professional repairer and have a big spot cut out and replaced with sound goods, at considerable cost. The inner tube can be patched by using solution, but the patch may loosen and come off at an aggravating time, so even here the owner will be wise to use a vulcanizer. With solid tires also, the vulcanizer comes in good. These often get a bad cut which if not closed up tears further or wears faster than the rest of the tire.

Oil has been used for cooling with good success and some oil supply houses furnish a high fire test oil looking much like kerosene but of much higher boiling point, probably above 400 deg. F. If your engine has splendid cooling ability this will serve, but if it gets hot easily do not try oil. There is a feeling that a tank full of hot oil, practically at the smoking point, is not a safe thing to carry about. The vapor from it will take fire easily. If there are leaks the floor gets saturated with an oil that burns easily and this is not nice. Alcohol is not very expensive nowadays and for a fairly cool engine I would advise it. You should have a densimeter to test with and so be sure the amount of alcohol remains sufficient to protect the parts from frost, but if the engine is a hot one as it should be, the alcohol soon boils out of the water and is both lost and useless. In that event I would advise calcium chloride.—C. E. D.

H. P. OF 9x13 ENGINE

[545.] Being a steady reader of the Cycle and Auto Trade Journal for some years, I ask you for the following information: What would be the A. L. and A. M. rating on a 4-cylinder, 4-cycle motor, each cylinder 9-inch bore and 13-inch stroke, 400 R. P. M and at 500 R. P. M.?

BOISE CITY, IDAHO. T. E. WARNKE.

The formula is for a piston movement of 1000 feet per minute. The bore squared 81 divided by 2.5 is 32.4 H. P. per cylinder which multiplied by 4 gives the power of the engine as 130 at 460 R. P. M. At lower or higher speeds the power would be less or more, being 113 at 400 R. P. M. and 142 at 500 R. P. M. These figures are slide rule readings and not strictly accurate. But remember that the formula was developed for auto engines of smaller size than the one you are asking about and in all probability your big engine will not develop nearly so much power. The big gas engine cannot fire its charge so quickly as can a small one. Very likely its mixture is not so homogenous.—C. E. D.

WANTS SMALL GAS ENGINE

[549.] Can you give me the address of a gasoline engine company that makes a small gasoline engine, say ¼ or ½ H. P. that would be suitable to run a family wash machine? Would a cylinder 1½x1½ be large enough with a speed of 500 R. P. M.?

MARATHON, IA. C. A. BISBY.

Such small engines are rather scarce. Write Peter Bros., of Algonquin, Ill., or J. E. Plunket, of 1342 West Lake street, Chicago.—C. E. D.

ANTI-FREEZING SOLUTION

[550.] I am using equal parts of denatured alcohol and glycerine in my radiator, making the solution two-thirds water and one-third of the above mixture, which I understand will stand 15 degrees below zero. Will you kindly inform me, if, when the radiator needs filling, it is necessary to use the same mixture or will plain water answer? I understand the glycerine will not evaporate, but whether the alcohol in such a mixture will or not I am uncertain.

SUCCASUNNA. N. J. N. H. ADSIT.

I have never used the solution you mention so have no practical experience with it, but it is my understanding that the alcohol will boil out. And I do not see an easy way to test it. If the alcohol leaves the solution it will be heavier, but this also is the effect of the water boiling out and leaving the glycerine. You can probably form a rough idea as to the amount of alcohol present by the smell. I would suggest that you use alcohol only and this you can test occasionally with a hydrometer and know what you have to deal with. Perhaps some of the readers have solved this query.—C. E. D.

(In the Motorcycle Motor Boat and Automobile Trade Directory nearly all the available anti-freezing solutions are given and discussed on pages 469 and 470.—Ed.)

SPEED ALL RIGHT IF VALVES CORRECT.

[552.] Am building a one cylinder, 4-cycle air cooled engine for motorcycle work, bore and stroke 3½ inches, intake valve (automatic) 1½ inches, exhaust 1⅝ inches, exhaust lift 5-16 inches, fly-wheels 10-inch diameter, inclosed in crank case, weight (fly-wheels) 24 pounds, compression 65 pounds.

Would this motor speed up as high as 2,400 R. P. M. if well made, and what would the horse power be at that speed?

2. Are the fly wheels heavy enough to enable one to start it with a crank?

3. Did you not have a motorcycle of your own make on exhibition at either the New York or Chicago bicycle shows in 1892?

4. I have a two cylinder V motor, cylinders are inclined 60 degrees from each other, both connecting rods are on the same throw, one outside fly-wheel 12 in. diameter, weighing about 35 pounds, both valves in the head 1⅛ in. diameter. The vibration of this motor is terrific at almost any speed, bore 3¼ inches, stroke 3 inches. How can a motor of this type be balanced?

5. Is not it a fact, that the V type motor vibrates more than a single cylinder?

6. Why does a coating of carbon in the cylinder and explosion chamber cut down the speed and power of a motor, and after being thoroughly cleaned out, shows such a wonderful increase in speed and power?

DAYTON, O. E. L. LeFEVRE.

Your motor will speed up to 2,400 all right if your valves are timed right and the spark well forward. The power is better found by test. The inlet should be very light and the lift small. Most folks fail to get the inlet valves light enough. Good steel should be used and every fraction of an ounce not needed taken off. I have used with good success inlet valves 1⅝ diam., which weighed but ½ oz. with spring.

2. The fly wheels are heavy enough to start with a crank. This is a matter of proper spark advance and proper mixture rather than fly wheel weight. If the engine turns over and the mixture is there to do the work and is not fired too early, the energy of the kick will turn it over the next compression and the lighter the fly wheels the quicker it will get going.

3. I do not remember any motorcycle as early as '92. Pennington had one at New York about '96. I built my first one in '97, but it was not exhibited anywhere. There seemed to be no demand for a power cycle at that date.

4-5. The V-type should not vibrate worse than a single. Its impulses should be smaller and more regular which should lessen the vibration. Possibly the pistons are too heavy. It is hard to balance such a motor. A fly wheel on each side helps. The balance weights should but partly balance the piston and rod. If they fully balance there is a cross vibration set up which is bad. The supports should be taken into consideration and the balancing done to favor the lines of least support. In auto work a vertical single cylinder is fitted with heavy weights so as to pretty well balance the piston, but the cross vibration is resisted by the frame. In a horizontal one the practice is the reverse for there the lengthwise mass and rigidity of the vehicle takes care of the piston vibration and the balancing of the crank pin and rod end to prevent vertical vibration is all that is needed. Study the direction of the vibrations and brace or balance accordingly.

6. A coating of carbon interferes with proper action. The particles get hot and fire the charge too early. This manifests itself as pounding but is really preignition with back pressure. If an engine is fired early enough it will scarcely run.—C. E. D.

BUILT UP CRANK SHAFTS

[553.] Can you advise me the name and address of firm making a built-up crank shaft? By built-up I mean one that is demountable in its cranks, etc. Such a crank shaft was exhibited at the N. Y. Show some two or three years ago, but I forget the name.

SOUTHAMPTON, N. Y. J. S. ALLEN.

I do not know who makes the shaft you want. There were several such shafts proposed when annular bearings were coming into prominence, but it has been found better to use a bearing large enough to slip over the bends of the shaft rather than make the shaft in parts. The Adams-Farwell revolving motor uses a built-up shaft, but it is only a single throw and probably not what you wish. I remember seeing the shaft you mention, but have forgotten who made it. Possibly the makers will see this or some reader may remember.—C. E. D.

QUESTIONS OF INTEREST

[555.] 1. What size platinum wire is used for hot wire ignition?

2. Would six dry cells or a 6-volt, 60-ampere have storage battery supply enough current to run a 3-cylinder engine using this ignition?

3. Can you tell me a way to get a continuous spark at three plugs? Which do you prefer, hot wire or continuous spark?

4. What is the weight of 1 cu. in. of cast iron (the kind used in fly wheels?)

5. In physics there is a statement that a highly compressed gas escaping rapidly reduces the temperature. A gas engine using 110 to 125 pounds compression ought to be very nearly noiseless (without a muffler.) Ought it not?

6. I have been waiting nearly a year to see your promised description of the "Owen Thomas Six" (shown at the last Chicago Show). May I look for it soon? It uses a rotary valve in the cylinder head and fuel injection.

7. Is the "Pleu Karp" rear axle and transmission combined being manufactured? It is described in a 1907-8 issue of the Journal.

8. Could the principle involved in question 5 be used to cool a water cooled motor? That is, could highly compressed air be allowed to escape rapidly past a coil of water pipes leading from the water jacket, reducing their temperature, thus acting as a radiator?

NEW YORK CITY. CHAS. E. JONES.

I do not know what size to use for hot wire ignition. My few experiments in this line were made with the small platinum wires found in the early lamp bulbs. They took a lot of current, but as I had a husky dynamo on the circuit I did not worry about that. Your battery supply would not be of satisfactory life. If you try to use battery better get the smallest platinum wire you can find. I think Baker & Co., of Newark and New York, can supply you. I have seen platinum gauze used for catalytic ignition in which the wires were probably not over .01-in. dia. By all means use the jump spark rather than the hot wire. You can buy the latter without any experimenting and after you get the job satisfactory you can go to the hot wire if thought advisable. Unless you wire using a coil for each plug, you will get all your sparks at the plug where the gap is easiest to jump. Better use a set of cells for each coil, but a good storage battery will feed three coils continuously for awhile. Wire each coil just as if it was the only one in use. Iron weighs roughly a quarter of a pound per cu. inch. About .26 while wrought iron weighs about .277. A high compression engine is usually less noisy at the exhaust than a low compression one. By using a very small compression space and throttling the charges so as to practically never take a full charge the gases can be expanded so as to be very quiet when exhausted, but such refinements are not suited to auto use as we now know the art. The Pleu Karp axle is no longer on our active list. Compressed air can be used for cooling, but the cost is more than the gain. To compress that air would heat it very much and this heat would be much more than the expanding air could take care of. The most efficient way of cooling is to blow the uncompressed air directly on the radiator or better yet directly on the engine. The Owen Thomas apparently never reached the state where publicity was desired.—C. E. D.

CLEANING CYLINDERS WITH KEROSENE

[556.] Have noticed a way of cleaning a motor when running by pouring kerosene in the air inlet of the carburetor. Quite a good sized stream can be poured in without stopping motor. This remedy is easily applied at the end of a run. Would like to know if as good results can be obtained from this method as from taking out petcock, pouring kerosene into cylinder and allowing it to stand.

PLAINVILLE, CONN. F. T. P.

Washing out the engine by any method is good practice. Kerosene or any solvent cuts the oil and loosens the carbon which is blown out through the exhaust. If the engine is not too hot, I think the running method is best for the motion of the piston will throw the liquid against the walls and sort of wash them. The standing method is not always sure for the solvent is likely to run past the piston and be loafing in the crank case instead of staying in the head of the cylinder where wanted. Some operators flush their cylinders with kerosene at the end of every run. This leaves the engine very free to start next time. If the walls are too hot the kerosene is evaporated and does not get a chance to wet the carbon and work on the oil in it.—C. E. D.

HAVE MAGNETOS COME TO STAY?

[559.] The problem that often enters my mind is whether the magneto will last as long in the automobile as it did in the telephone business. Magnetos formerly held a very important place in the telephone exchange as well as on the lines. Each operator's position was equipped with a hand power magneto that she would use if the larger motor driven one should fail to do its part. But now only a few years later most of those magnetos are stored away in the cellar or were sold for a meagre sum. Now magnetos are never used around central offices of any size, and only a few on rural lines where the work is very intermittent. Since the circuits of most magnetos, used on igniting systems, are shortened excepting when drawing current from them, the load on them is much heavier than it would be with a telephone magneto of the same size. Consequently the life of the field magnetism must be shorter with the igniting magneto.

Vibration and heat both cause permanent magnets to lose their magnetism and a magneto on an automobile must stand these losses too. Electricity was of no commercial value until after better ways of generating it than the magneto were developed. So why go back to the primitive way of generating electricity from power, for igniting in gas and gasoline engines?

POUGHKEEPSIE, N. Y. J. L. McNEILL.

I am not enough acquainted with the telephone business to discuss with you the why and wherefore of the decreased use of the magneto which you say has occurred. But in auto work, the auto which gets the most power out of the fuel, has most responsiveness to the throttle, is least likely to miss fire and needs least attention to its parts is the one which will win out.

This is particularly true as the auto is used more and more for daily business work and less for pleasure. Magneto equipped autos meet these conditions admirably.

A large magneto spark fires mixtures which the battery spark sometimes misses and therefore more power and greater flexibility result. Most users seem to prefer the magneto. True it does lose the strength of its magnets in some cases after much use, but they can be recharged and made good as new with little trouble and expense. It is not a primitive method, although used on Duryea vehicles in '96. It has been a very gradual development wherein merit has won, and promises to be almost universally used.—C. E. D.

ENDORSES WESTERN RIG

[558.] I want to "second the motion" of No. 528, "Plea for a Practical Rig for the West," of G. W. Trobitts, of San Francisco, Cal., and say that the kind of rig he wants for the West, would be just the kind I want for the East.

If all motor cars were like his description, the beautiful roads of New England would not be torn up and ruined in a season by the low clearance, two ton cars that are in vogue here; and their owners could tour just as far, and ride just as comfortably.

Can you give me the address of a two cycle, air cooled engine builders who will answer inquiries? I have written three or four whose address I found in your columns and have received no answer.

GLOUCESTER, MASS. R. W. PHELPS.

With lights cars at $475.00 upward you have a large field now to choose from. You might send 25 cents to the Ferro Foundry, Cleveland, for a 2-cycle book well worth the money. I do not know any one making a 2-cycle motor for car driving for general sale. Plenty of marine and stationary 2-cycle motors are to be had.—H. D.

H. P. OF OPPOSED MOTOR

[561A.] Would you kindly answer me a few questions in the next issue of your Journal? What is the horsepower of a 2-cylinder horizontal opposed motor, 4x4 inches, with a speed range of 150 to 1500 revolutions? Would not the above motor be powerful enough for a 1100-pound runabout equipped with planetary transmissions and gear drive with 28-inch wheels and geared up to 35 miles an hour? Would it with two passengers be powerful enough to negotiate the steepest hills, sand and bad roads?

ELGIN, IA. THEO. L. LOFTSGARD.

Your motor should give 10 to 12 H. P. That size is often rated higher. It is strong enough for good service with the weight you mention. Whether it will make the speed and do the climbing you want is a matter of gearing ratio, but I think it will do so. If you can choose better have more power, 100 pounds per H. P. is considered rather heavy nowadays, although is has not been many years since this was thought to be a high powered ratio.—C. E. D.

DIFFERENCE IN POWER BETWEEN SINGLE AND TWIN

[568.] How much horsepower if any will a twin cylinder than a single cylinder of same H. P.? How much more speed? What is your opinion of the belt drive on the Excelsior and the chain drive on the Indian, which is the best? What is your opinion of a low speed and a high speed motor?

CLEBURN, TEX. C. M.

Your question as to power is not clear. Two engines of same power will give the same power. The single cylinder will probably be more economical. The double will probably cool better. It will also be better balanced and in power application it will be steadier. It will draw on the carburetor more evenly and possibly deliver more speed, but there is no certainty about this. I cannot undertake to decide between the merits of two systems. Their designers differ in opinion and their buyers likewise will do so. The chain is most positive and probably gets most speed out of a given power. But it is also most noisy and jerks the machine more so it is likely less comfortable. The belt is always in perfect pitch but as soon as the chain stretches it does not fit the sprockets properly and some grinding and loss of power occurs. I favor the high speed motor for auto and cycle propulsion. If the motor has a wide range the gear changes do not need to be used so often. The steam engine is an almost perfect motor for auto work if it was not tied to the boiler and the gas motor which most nearly approaches it is best.—C. E. D.

IS FRICTION DRIVE O. K.?

[566.] I am interested in the friction drive automobiles, but there are none of them in this country, so would be very much obliged if you would explain a little for me. As to its efficiency for real hard work through sand and its power at high speed, whether there is much slippage? It it is noisy and how it compares with other cars? Detailed information would be greatly appreciated.

NOGALES, ARIZ. W. E. KARNS.

The friction drive is a debated problem. Some of the folks who have used them are loud in their condemnation, and on the other hand, we get the finest kind of words from other users. My own experience is that it is a very sweet drive. That it gets more out of the engine than other drives. That a rig so fitted can do stunts that other rigs cannot. That if the user will take the trouble to learn what his friction surfaces require he will not have much trouble with them. That the rig must be built right. As a prominent friction drive maker put it some years ago, "They are all right if they are right." There is not much slip and wear at high speed. There is more at the low speeds. A good one is not noisy. In general they are less noisy than chains or gears. Choose a make that has been on the market for several years and you will not likely be disappointed with the drive. I think the number of makers is likely to increase faster than the business grows so I believe the proportion of friction driven rigs is increasing.—C. E. D.

CAN'T CLIMB WITHOUT TRACTION

[569.] Kindly advise me through your Mechanical and Technical Department in your Journal if it is possible for an auto to climb a hill that it can not stand on with locked wheels, even though it has great horse power?

CLEVELAND, O. H. KUNDSEN.

If a hill is so steep that with the wheels locked a car will slip it would, of course, be impossible for the wheels to have sufficient traction to drive the car. These are, however, conditions which are not met with in practice.—Ed.

2-Cycle Engines

HUGH DOLNAR.

Questions will not be answered in this department unless the inquirer gives his name and address. The name and address will not be published if so requested. Put name and address on all drawings. When possible fold drawings and mail in envelope with the description.

MECHANICAL DEVICE TO GIVE CORRECT 2-CYCLE VALVE TIMING

[546.] In the usual construction of a valveless 2-cycle engine the piston head on the out stroke opens the exhaust port first and then the intake port. This seems to be correct in principle. On the instroke the intake port is closed first and then the exhaust port, which seems to me to be incorrect in principle. In other words I should think that the correct way would be to have the exhaust port close before the intake port, on the instroke. Please give your views on this question. If I am right in my idea undoubtedly a simple mechanical construction which would close the exhaust port before the intake port on the instroke would be commercially valuable.

SOMERSET, PA JOHN I. HOLDERBAUM.

The 2-cycle motor is not always made with ports as you know it. You refer to that particular type of 2-cycle motor commonly used for small boats and for motor cars, with cylinder supply by crank box pressure and both intake and exhaust ports uncovered by the piston at end of working stroke and closed by piston at beginning of compression stroke. which is the simplest, lowest cost and least efficient form of the 2-cycle gas engine. Gas engines of 2-cycle type are made in large units 1,000, 2,000 and 4,000 H. P., which have valves and open and close the ports in proper time and sequence.

Small 2-cycle engines, such as you know and refer to, are also made largely with exhaust ports only at the bottom end of cylinder, uncovered by the piston at the end of the working stroke, and closed by the rise of the piston at the beginning of the compression stroke, the charge intake being had through an automatic valve in the cylinder head supplied by a side pipe the whole length of the cylinder, from the crank-box to the automatic valve in the cylinder head. This form of 2-cycle motor, crank-box cylinder supply, opens the intake valve as soon as the cylinder pressure falls below the crank-box pressure and automatic valve resistance to downward movement, and as the crank-box charge volume can never be enough to fill the cylinder no part of the fresh charge can be wasted by passing out of the open exhaust port save by muffler partial vacuum suction.

As to the valve and working feasibility of your scheme for making exhaust port close before the viewing piston closes. the intake port, it is, of course, desirable that no part of the entering cylinder charge should be wasted by passing out of the exhaust port unburned. Broadly speaking, there is no novelty in your suggestion. Mechanically speaking, it seems difficult to place any device at the bottom end of the cylinder which would work at high speed and high temperature to close the exhaust port by the movement of the viewing piston before the intake port was closed by the same agency. As before said, and as you say, the exhaust port should be closed before the fresh charge is forced into the cylinder, to avoid wasting unburned fuel by exit through the open exhaust port. If you choose to send me a sketch of your improvement I will tell you what I think of its working probabilities. If your device is simple, low cost, durable, noiseless and avoids possible waste of fuel, then it is of value, commercially.—H. D.

2 CYCLE LUBRICATION AND THERMAL COOLING

[530] I have an '06 4-cylinder 2-cycle car that has given me excellent service to date, but now needs a little overhauling

and I would like to ask if the following changes would be advisable:

(1.) To substitute thermal for pump circulation. My pump has not worked well lately and a new one is now needed. Would the present radiator and piping suffice for thermal use. If not, what changes would be necessary?

(2.) To substitute a gear driven high tension magneto for present four unit coil and timer. Is there any magneto made that I could crank the car on so as to do away with necessity of coil system to start on?

(3.) The main engine bearings are fed by grease cups—with oiler for cylinders. Could I safely do away with oiler and mix oil in the gasoline. I have had trouble with the oiler several times. Grease feeds to be retained.

It seems to me that if I could do these things successfully I would simplify my car greatly, but don't want to go to expense if satisfactory results cannot be obtained.

I note you have advocated oiling via the gas tank, but cannot understand how the main bearings receive any lubrication. If they are gas tight, as they should be, are they not also oil tight and likely to burn out? Would the form of oiling you advocate oil both pistons and wrist pins successfully as well as cylinder walls? What proportion of oil (to gallon of gasoline) should be used? Do you advise putting graphite in the oil?

MINEOLA, N. Y. INQUIRER.

(1.) I suppose your water pump is either centrifugal or sliding piston. If so, simply take out the rotor, make the pump casing water tight, and see if the motor will cool all right. You may not have to change anything at all. It is common practice to give more piping cross-section area for thermal circulation than for pump circulation.

(2.) There are high tension magnetos which work without coil or timer. I am not a high tension magneto expert. The right thing is low tension magneto and hammer spark. You will have to consult some one else on high tension magneto matter. You can get what you want I believe.

(3.) Keep your grease cups, although not really necessary, if the lubricating oil, one gill to 1½ gills to a gallon of gasoline, is placed in the gasoline tank. I do not advocate this plan of oiling, but I have seen it used successfully with crank-box cylinder supply and 2-stroke cycle.

To enable a shaft to run at all it must have oil room in its bearings. Your crank shaft bearings have room enough for oil. The lubricating oil is imperceptible in the gasoline, but deposits itself on the first metal surface contact where the mixture from carburetor is not in quick movement, and so this method of gasoline and lubricating oil mixed oils the entire motor, 2-cycle and crank-box cylinder supply, as the mixture comes in contact with every moving part in the crank box. One fault of this method of lubrication is the probability of uncertain lubricating oil supply. A little reflection will show you that you can never be sure that the lubricating oil has been placed in the gasoline tank, because all routine acts are uncertain. When the driver fills the gasoline tank he is not sure whether he added the lubricating oil or not, and all he can do is to add the lubricating oil to make sure.

The great objection to all mechanical oilers, splash oiling and gasoline and oil mixture oiling, is the waste of lubricating oil, as by these methods all oil once delivered to the crank-box never comes back, but goes to oil the floor or the road. I believe the only correct oiling is by the elevating and gravity return system, with unobstructed oil leads and flooded lubrication. A well known designer told me the "return" oiling saved $25 a year in lubricating oil, besides being sure to oil everything.

H. D.

Almost any of the established magneto makers can supply you with high tension magnetos with which you can start by cranking and the Bosch people have recently placed on the market magneto start-on-the-spark device.—Ed.

2-CYLINDER OPPOSED 2-CYCLE ENGINE NOT NEW

[570.] Will you kindly have your gas engine expert answer me a few questions. Has there ever been built a 2-cycle opposed two cylinder engine, both cylinders using base compressions from one base and exploding at the same time?

Yours truly.

ITHACA, N. Y. M. SCHRYVER.

Two cycle, two cylinder opposed engines have been built and operated, the explosions taking place in opposite cylinders at the same time, and using the crank case compression in the single case between the cylinders. The writer designed such an engine in 1904, and in the same year ran across an engine of this type already built and running in Chelsea, Mass. The feature of the engine is, of course, its lack of vibration, as not only the moving parts are balanced but also the reaction due to the explosions. A nail or a screw with flat head could be placed on the crank case of this engine when running at seven to eight hundred revolutions per minute and no perceptible vibration be seen.—Ed.

REFERRED TO LARGE ENGINES

[571.] You state in November Cycle and Automobile Trade Journal, page 117, that (under certain therein stated conditions), a 2-cycle motor using separate charging cylinders and fuel injection can be made to give twice the power of a similar 4-cycle. Please give the names of the people who have or are building such motors either of marine, automobile or stationary type. What air charging cylinder pressure has been found most desirable and what should be its capacity relative to that of the power cylinder?

NEW YORK CITY, N. Y. E. B. BENJAMIN.

For some years I have paid no attention to any motors save three used for car-driving. Write the De Luxe Vergue Co., Port Morris, New York, for printing descriptive of large, double acting 2-cycle gas engines, up to 8000 H. P. units. There are several European builders of large stationary 2-cycle gas engines. See any of the foreign engineering periodicals. All I state as to separate charging cylinder practice for 2-cycle motors is very old and well known. The charging cylinder pressure should be as low as possible. You will readily see that it need be but very little, as the charging piston stroke end can be made to suit the closing of the intake port, so that all the charging piston has to do is merely to move the charge in the time available for cylinder charging. Most of these large engines use producer gas and the charge volume of both air and gas is under governor control, probably for maximum duty. The cylinder charge is above atmospheric pressure where the compression begins. You are in New York City, go to Astor Library and you will find some good gas engine reading. I cannot give you much on the elements of gas engine practice in this limited space.—H. D.

SEPARATE CHARGING CYLINDERS FOR 2-CYCLE MOTORS

[560.] I have been a constant reader of your Journal for several years, and have been very much interested in the articles on the two cycle engine problem.

I notice in your November issue, you speak of a separate charging air cylinder instead of crank box charging. (a) Will you kindly tell me if you mean that your idea is that each firing cylinder must have a separate charging cylinder, making two pistons and two connecting rods for each firing cylinder, or one large cylinder for all three or four as the case may be.

(b) Will you also kindly tell me what your objections are to crank box charging with cold air only?

You also speak of injecting fuel, liquid or finely powdered. What do you mean by finely powdered? (c) Now it seems to me that if as you said, a well proportioned cylinder can give 1 7-10 power, or 7-10 more than a four cycle, that the people would accept such an engine and not fight against the two cycle, as they apparently do. But it has always seemed to me that if a two cycle engine, bore and stroke the same as the four, would give as much power as the four cycle, that it would be preferable by far with all the valves, cams, gears and springs cut out, and why the people will not accept this is beyond me.

It must be some other trouble like carburetion, as certainly the Elmore car seems to get along in fine shape and has a good record as well as the Simplex. I fully believe the same as you, that the two cycle will be the accepted engine sometime in the future, but cannot quite see how you all the time speak in your articles, and say the piston must be light, cylinder bore not high, etc., to accomplish this end. The beauty of it, of course, is simplicity, and nothing could be much more simple than the Elmore at the present time.

I simply write this so that I might be able to find out from you what your ideas are, and have you explain the separate charging cylinder matter, and your ideas of the proper way for injection of fuel. Would also like to have some of the readers take this up in your Journal and give their ideas. There is no question but what the two cycle has a host of friends, and by comparing and asking questions, a great deal can be done sometimes.

BRIDGEPORT, CONN. C. H. S.

(a) Yes; each cylinder should have its own supply cylinder.

(b) If you mean crank box charging by working piston displacement, the cylinder cannot be filled as the displacement volume is not enough to fill the cylinder. Crank box pressure is hard to maintain, and drives out lubrication, and is a bad job generally; of course, it can be used.

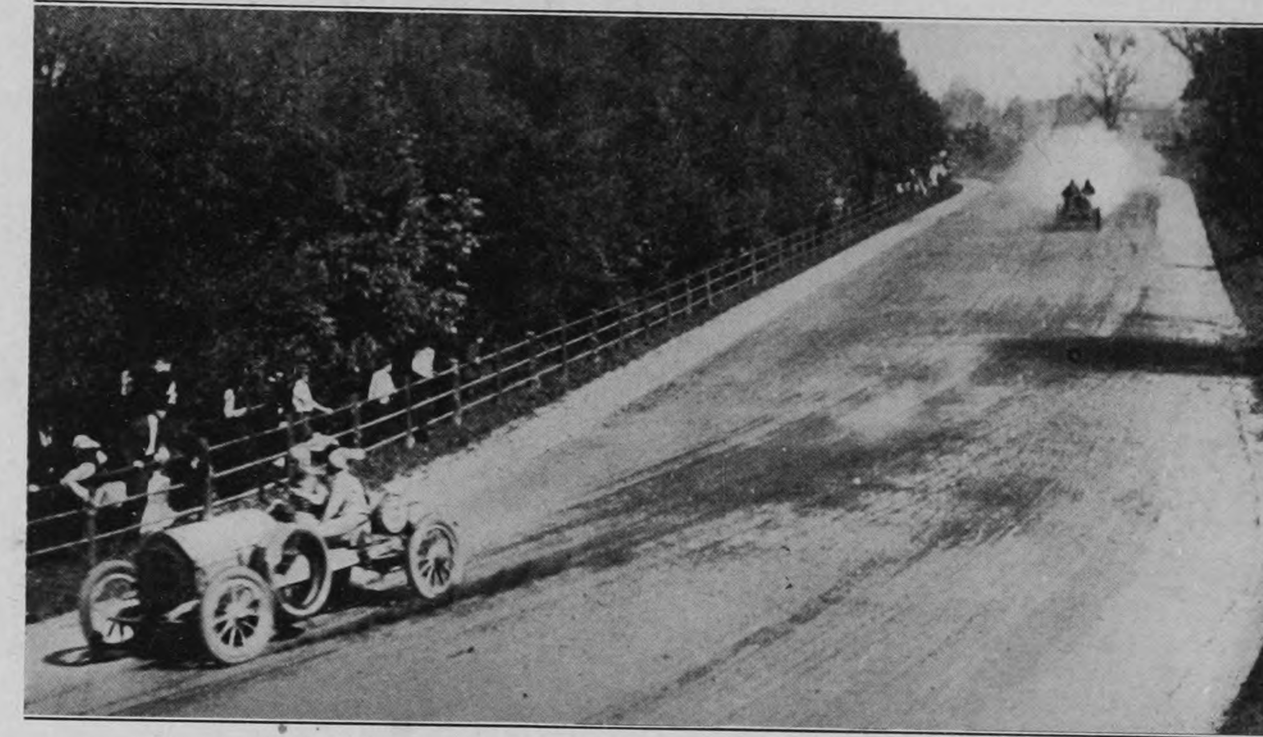
(c) The 2-cycle "Atlas" claims 1.7 the horse power of equal 4-cycle cylinders. The "American Simplex" makes claims of greatly increased power and to my knowledge gives much better than ordinary ton mileage to the gallon of gasolene consumed.

(d) It is a perfectly easy matter to build a bad 2-cycle engine, and perfectly easy matter to build a good 4-cycle gas engine. There is now a general desire among motor builders to do away with the cam shaft and puppet valves, but they are not yet displaced because car builders can sell cars with 4-cycle motors more easily than with 2-cycle motors. It is very hard to find any man who wants to put up money to build cars and put 2-cycle motors in them to sell in open market.

The things you ask me to explain as to fuel injection, dry fuel in finely pulverized form and so on, are well known in various forms, and cannot have space for detail description here.—H. D.

Oilzum

—WINS!—



[Photo by Spooner & Well

Mr. BERT DINGLEY of California driving CHALMERS-DETROIT Car No. 5
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Opinions and Suggestions

Under the above heading we will be pleased to publish letters from our readers expressing opinions, stating how they have overcome difficulties, or making useful suggestions. In this department will also be published longer communications or articles, of either a general or technical nature.

SPARK PLUGS

What to Look Out For and How to Take Care of Spark Plug Troubles.*

Unfortunately, spark plugs are one of the features most essential to the proper working of the modern automobile motor, yet the plugs are so accessible that the average motorist is very apt to tamper with them every time the motor behaves badly. In the brief space here devoted to this subject but a few hints can be given:

First of all do not remove the spark plugs every time the motor skips until reasonably convinced that the plugs are at fault. Their removal often cracks the insulation and breaks the well made joints with the cylinder head, so that when replaced there may be a chance for the compression to leak by the plug. Such a leak can be tested by squirting a few drops of either kerosene or lubricating oil around the plug after it has been replaced. Turning the engine over will then disclose the leak, if any, by bubbles appearing. If no gasket is provided on the plug (a copper-asbestos one being preferred), a good joint can be made by the use of pipe joint compounds containing graphite (do not use white or red lead); a graphite joint is just as tight and the plug can be removed with ease at any time. Red or white lead becomes so hardened that it is almost impossible to take the plug out. After removing a hot plug for any reason, remember not to screw it into the engine as tight as possible with a fourteen inch wrench, as you may crack the hexagon shell, or, as the plug has probably cooled off and is contracted, while the engine is still hot and expanded, the contraction of the engine onto the plug may make it impossible to remove it at some future time. This precaution applies more to air cooled engines where the cylinders are apt to be extremely hot.

The distance between the points of the average spark plug should be about one-thirty-second of an inch. Less distance clogs easily and is not as apt to produce a large spark, while if the batteries are weak a larger distance under the compression in the cylinder may cause sufficient resistance to entirely suppress the spark, although the same plug with the same gap may show a good spark when laid on the outside of the engine so as to form a ground. Don't vary the distances between the points, as this will spoil the uniformity of the spark gap in the various cylinders, and bending the points back and forth may loosen or weaken them so that they will come out and may do damage in the cylinder.

Excessive lubrication of the motor should be avoided, especially where the plugs are directly in the head, as they will be covered with oil in which particles of carbon are carried, and this will eventually form a bridge across the gap, making a line of easy resistance for the current so that no spark will take place.

Do not get oil on the outside insulated portions of the plug, as dirty oil will in almost any case form a bridge for the current, which will pass from the top of the plug to some of its metal parts, forming a short circuit. In engines which throw oil badly on the plugs, it is sometimes easier to place the plug in an offset made of ordinary pipe connections than to remodel the oiling system. Even a slight crack in the inside of the porcelain will allow the current to pass directly from the central electrode to the shell of the plug, thus short circuiting it. By grounding the plug on the engine and turning the engine over so as to make the proper contact, a spark should pass at the plug gap; and if no spark occurs and everything else up to the end of the secondary terminal has been tested, this shows the plug to be defective. If this spark is a weak one, under the increased compression in the cylinder, the same plug may fail to work when in place; try another plug. In cleaning a plug in which the insulation extends well toward the end of the central electrode, be sure that the carbon deposit is removed from this insulation, as this is more important that filing the actual ends of the electrodes. Do not needlessly take the plug to pieces, as this usually results in spoiling the joint between the insulating material and the metal and will cause a leak. Plugs can be sufficiently cleaned by washing them in gasolene.

Do not use force in screwing on the thumb nut holding the terminal, as the very fine threads may either be stripped or the electrode twisted, causing defective insulation, a leak, or if its lower end is bent, too wide or too small a gap between the points.

If a taller plug than usual is inserted, make sure that its upper end does not come within sparking distance of the under side of the hood. When plugs which are apparently defective when used in a certain cylinder operate better in another cylinder, it is usually a sign that the trouble is not in the plug. Carry extra plugs, or at least one extra, as in cases of extremity it is sometimes possible to use parts of a defective plug in combination with parts of one of the other plugs.

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* From the Exide Sparking Battery. Article by E. S. Foljambe, Managing Editor, "Cycle and Automobile Trade Journal." Printed by permission, Electric Storage Battery Co., Phila., Pa.

Do not carry plugs loose in your tool box if you wish them to be in a condition for emergency.

When trouble occurs, test the various parts of the ignition apparatus systematically and do not at once jump at the conclusion that the spark plugs are fouled.

WHAT THE TROUBLE WAS

[554] It is hardly fair to the Editor not to give all points possible that can be dug up about our motor and car troubles when applying for help.

In question No. 507 I requested advice as to where to look for trouble with the pump.

Since then while looking at the gears of the pump I noticed that each gear had six teeth. I also noticed the tendency of one tooth to wear a groove near the bottom of the tooth in the meshing gear. This suggested wrong shape as the cause of the trouble. Upon looking up data covering gears, this paragraph was one of the first that was found "Pinions of twelve teeth will work very well, but a less number of teeth should not be used." The water pump in question now has twelve tooth gears and no more trouble is anticipated through teeth wearing a groove and then catching on edge of the grove when bearings become slightly worn.

PLAINVILLE, CT. J. J. W.

COMMUNICATION—LIGHT WEIGHT CARS

I am very much interested in an article appearing in your last issue under the heading, "Opinions and Suggestions," signed by the Cameron Car Co.

While the desire of those getting up a weight classification may have been to cut out any freak racing models, it certainly should not cut out any maker's car who could prove that his car entered was of exactly the same weight as his regular stock models.

The time is near at hand when the maker who cannot put out a car that will carry two or four persons under any ordinary road condition at as fast a speed as is safe, that will not weigh over 1600 pounds at most, will find himself a back number.

The maker who insists on making a 2,000 to a 3,000 pound car to do this work is standing in his own light and hindering the industry. That the cost of upkeep of a heavy car is far greater than a well-made light one, any one who has had experience with both, must admit.

The expense of tires alone is a great item, and from the rise in rubber, it will be a far greater one.

Is it not a fact that it takes better designing and better material to carry the same load on a car that weighs actually about half what another would?

Compare the motors: The piston displacement and valve designing will prove about the rating each maker should be safe in claiming. Then imagine one "24 H. P." motor placed in a car weighing 2,400, and expected to carry four average persons, or about 600 pounds. This would make the motor carry a load of 125 pounds per H. P.

Then take the same motor, or one of another makers, rated at 24 H. P. put into a car with an actual weight of 1,400 pounds, then add the four passengers, making 2,000, or about 83 pounds per H. P. In other words, the motor in the 2,400 pound car would have as much trouble in taking its empty car up a hill or through mud as the lighter car would have in carrying its load of four passengers.

CHAS. L. V. BERG.

Le Mars, Iowa.

COMMUNICATION SUGGESTIONS FOR WESTERN AUTO

I have been an auto driver in the North West for seven years and I can fully indorse article 528 in the November issue, On a Practical Rig for the West. However, I wish to make a suggestion too. Use a three speed ahead and reverse selective type transmission roller or double ball bearing all incased and run in oil and in the bottom of the case have a good sized pocket to allow all particles of cuttings to settle away from the gearing and be to the transmission as mud flue is to a steam boiler.

As to the tire equipment I will suggest an air tire, but so heavy or thick that it would stand a very high pressure and be between the present air tire and a solid need not be over 3 inches or 3½ inches for 1200 to 1400 lb. rig. That is heavy enough for three people or the equivalent, wheels should be not less than 36 inches diameter. If a two-cycle engine is used 2 cylinders are enough, 4 cylinders for a 4-cycle engine.

Now, a word about the cooling of this engine. A man has no business trying to navigate over this country with an air cooled rig unless he has power far in excess of the weight of his car and load, as I have had the experience and paid for it. I tried three different air cooled rigs, two I bought and one I built myself, and the result was all the same. Adding fans to keep the cylinder cool was adding trouble. In that the fans required oil. The oil would run down the fan blades and was blown on the cylinders. Then all the dust that came in contact with the oil collected and made a good jacket to hold the heat. The air cooled engine works at a higher temperature, requires more frequent adjustment. I am not saying anything about the 2-cycle engine, as I never had any experience with them.

H. H. WILBUR.

Where you can find us at the New York Show

CYCLE AND AUTOMOBILE TRADE JOURNAL

(Published in Philadelphia)

Grand Central Palace Space No. 23 MAIN FLOOR

¶ Immediately on entering the main exhibition hall, turn sharply to the right. Our space is against the partition wall, about 50 feet from entrance on main floor.

Remember we also publish the **MOTOR CYCLE, MOTOR BOAT & AUTOMOBILE TRADE DIRECTORY** and have on file a great deal of valuable data concerning exhibitors, and will be pleased to answer such queries as the trade and others may make. A cordial invitation is extended to all to make our space at the show headquarters for meetings, etc.

CHILTON PRINTING COMPANY, PHILADELPHIA

EVERITT THIRTY

BY C. E. MORRIS.

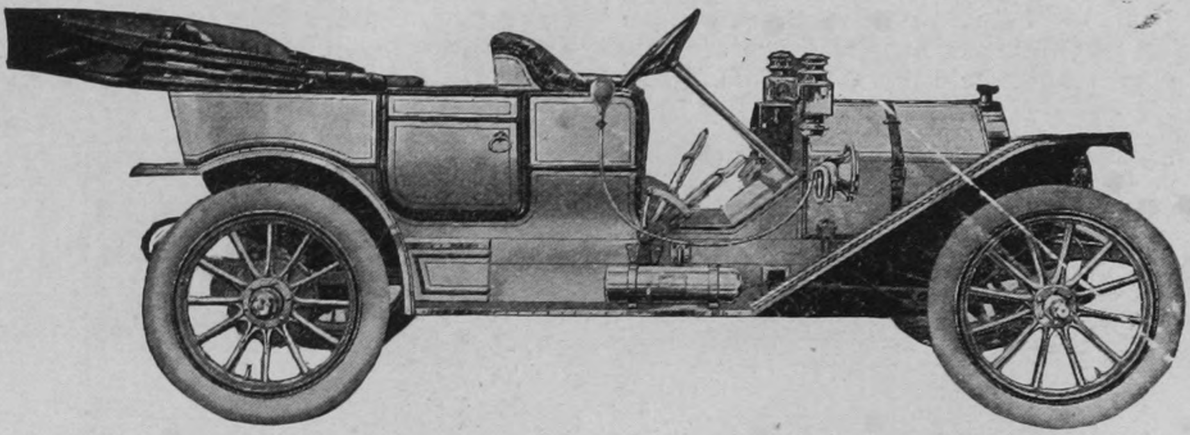
The season of 1910 promises to be notable for two things, better cars for less money and the advent of various features of construction, hitherto deemed impossible. One of the season's sensations is the "Everitt Thirty," the product of the Metzger Motor Car Company, of Detroit, Mich., and as the name implies it is built by a Metzger combination and that is saying much in favor of the vehicle. Motor car engineers during the past three or four years have striven to attain a more simplified construction, the doing away with numerous parts not actually necessary to the successful performance of the vehicle. Simplicity, the watchword, was well in the mind of Designer William Kelley when he laid out the "Everitt Thirty," for surely, up to date, it represents the acme of simplicity. For instance, the upper crank case section, the four water cooled cylinders with integral water jackets, the inlet and exhaust manifolds are cast in one complete integral unit. The simplicity of this construction is readily apparent. The cylinders are cast en-bloc, which form of construction is rapidly coming into favor on both sides of the water. Such a construction a few years back, in fact not so far back, would have been virtually impossible, for not only must the designer and builder of the car keep abreast of the times, but the founder as well to whom reverts one phase of a successful product. This construction may justly be regarded as a mechanical masterpiece for it is by no means an experiment. Engineer Kelley has had a car on the road for many months trying out this feature of construction and the worth of it has been proven on more than one occasion. Then again, another feature that

The motor of the "Everitt Thirty" is n
in design, compact and thoroughly fit
The Metzger Motor Car Company w
incorporated September 20, 1909, havi
a capital stock of $500,000 of which $3
000 has been paid in. The stockhold
and officers are Byron F. Everitt, pre
dent; William Kelley, vice-president; W
liam E. Metzger, secretary and treasu
All three men have been interested in ot
cars and are well and favorably kno
to the industry, and, previous to sell
out their interests in the E-M-F. to
Studebaker Company, were factors in
production and sale of that car. A r
about and four and five passenger c
comprise the line of the new compa
which is now fitting up a large facto
which, when completed, will be adequ
for turning out the 5,000 or more c
planned by the concern. The new fact
has a floor space of 156,000 square f
and covers 2½ acres of ground. He
the Metzger Motor Car begins operati
fully equipped.

MOTOR.

The motor of the "Everitt Thirty,"
above stated, is of the four cylinder wa
cooled type water jackets being integ
cylinders cast en-bloc and by reason of
fact that the upper section of the cr
case is cast integral with the cylin
block there is no necessity for secur
the cylinders after the older method
bolting to the upper crank case secti
One-half on the motor gear housing
cast integral, with the motor set. T
cylinders are 4-inch bore and 4¾-in
stroke, cast of selected gray iron, pist
are of the same material having four
centric diagonal lapped ground rings, th

Model 19 Haynes—$2000



No other manufacturer has ever presumed to give such value for a moderate price.

This Model "19" is a revelation to **everyone.**

One man went so far as to tell us that it would **bankrupt** the Haynes Company to put out this car at $2000—that we could not **possibly** hope to "play even" at such a price.

And the man is an experienced motorist at that.

The "19" **is** an innovation, and **is** sold at a close price, **but here** is the point:

This car will make Haynes cars for 1911 sell as easily as Standard Oil stock at par.

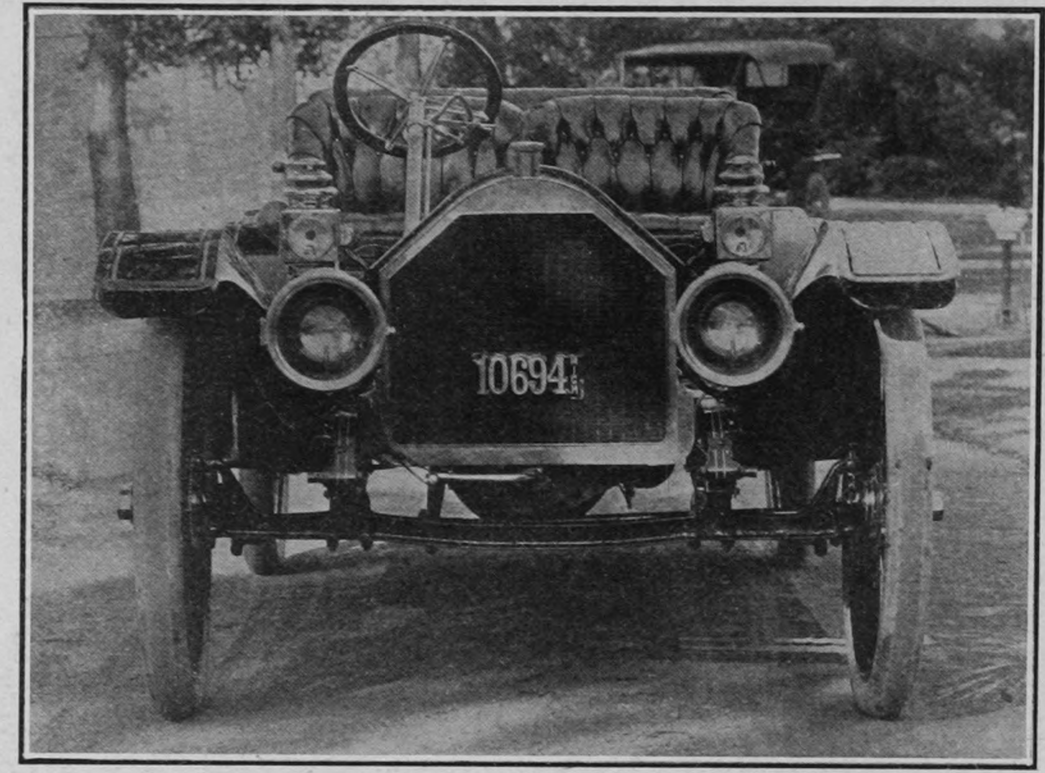
It backs up everything we have said about the Haynes being **the only car of established reputation selling at a moderate price.**

It is unquestionably the biggest automobile value on the 1910 market—and a ride in it will quickly prove this statement.

Literature on request.

Haynes Automobile Co.

1 5-16-inch set screw, the screw entering the pin itself so that all possibility of turning or side swaying is precluded. The crank shaft is of the three bearing type, the bearings being retained in the upper section of the crank case and are of plain die cast metal, held by 9-16 steel studs.



The new "Everitt Thirty" made by the Metzger Motor Car Co., of Detroit, Mich.; wheel base, 110 ins., trea standard; tires 34x3½ front and rear, demi-tonneau, runabout or touring body; 30 H. P. motor, 4x4¾; 4 cylinde cast en-bloc; water jackets and upper section of crank case cast integral with cylinder block; valves all on o side, circulation by pump constant level splash lubrication, ignition by magneto, with provision for dry battery; sele tive sliding gear transmission on rear axle; three speeds forward and reverse; leather faced cone clutch; drop forg I-beam front axle; full-floating rear axle runs in Hyatt roller bearings, internal expanding and external contracti brakes on rear wheel drums; irreversible worm and sector steering gear, control levers below 16-inch steeri wheel; semi-elliptic springs front and full-elliptic, scroll ends, in the rear; price $1350, f. o. b. Detroit.

The main bearings are 1 7-16 inches in diameter, the rear bearing 1 inch. The flywheel is bolted to a web on the crank shaft and is 18 inches in diameter. The cam shaft is of nickel steel the cams being integral and is 1¼ inches in diameter, a little larger than would be necessary yet the increased size is but an added factor of safety. Cam shaft bearings are of phosphor bronze. The working side of the motor is, of course, the left, the valves all being on the left side actuated from the one cam shaft. All valves are of nickel steel and are interchangeable. Valve springs are of spiral steel and the plunger guides which are bushed are carried direct in the upper section of the crank case, the contacts being hardened and ground with provision for take up for wear. The working side of the motor presents a very neat and trim appearance

by four ¾-inch steel studs, this cast forming the water outlet, the discha nozzle as well as the fan support be cast integral. In the matter of machin the motor castings this one feature wo effect a saving in time of operation. A other feature of construction not seen many cars yet and which is meeting w favor and more in evidence his year th ever before, is the method of motor s pension. Instead of cast arms integ with the crank case, there is used inste two I-beam drop forged steel beams which the motor casting is bolted on t upper crank case section. This provic for a rigid support, the beams being a chored to the chassis side members. T magneto is carried on the left side of t motor on supports cast integral with t crank case lower section and is driv through a universal joint from the pu shaft which in turn is actuated off t half time gears of the motor. The wat pump draws in the water supply from t base of the radiator and discharges through a curved lead into the jackets the motor and, after due circulation forced out through the dome plate d

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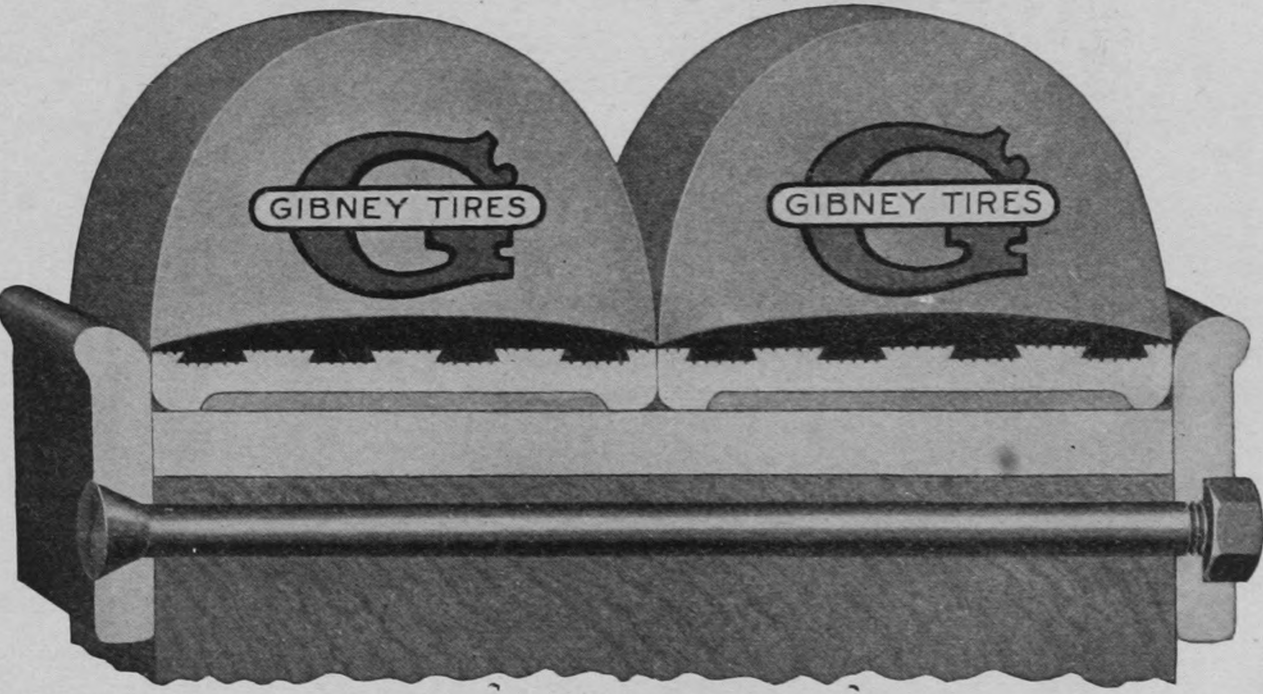

¶ Their remarkable durability keeps tire maintenance cost down to the lowest possible figure; their superior resiliency is a guarantee against engine jolts and repair bills.

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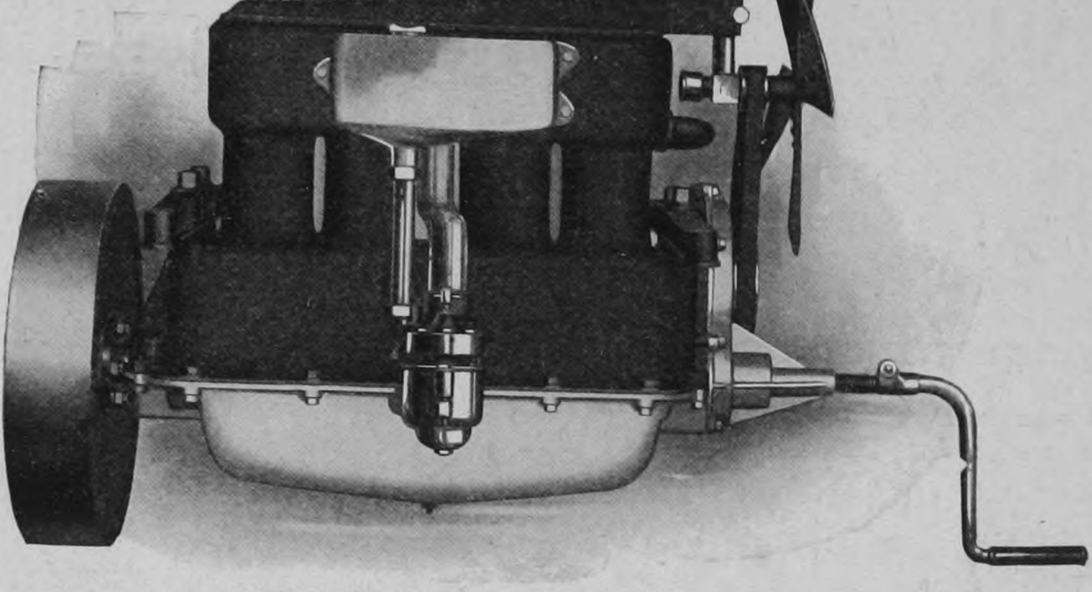
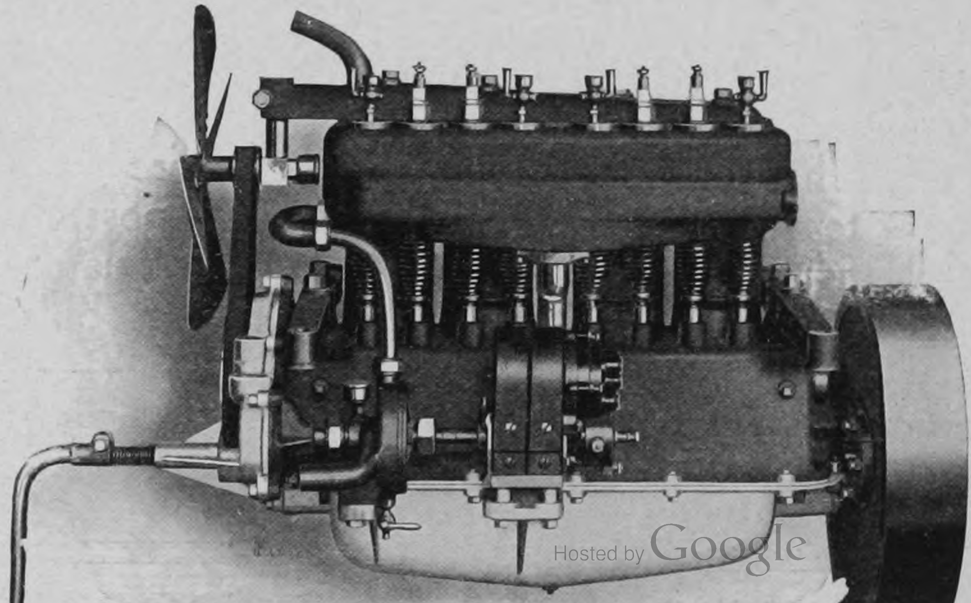
JAMES L. GIBNEY & BROTHER

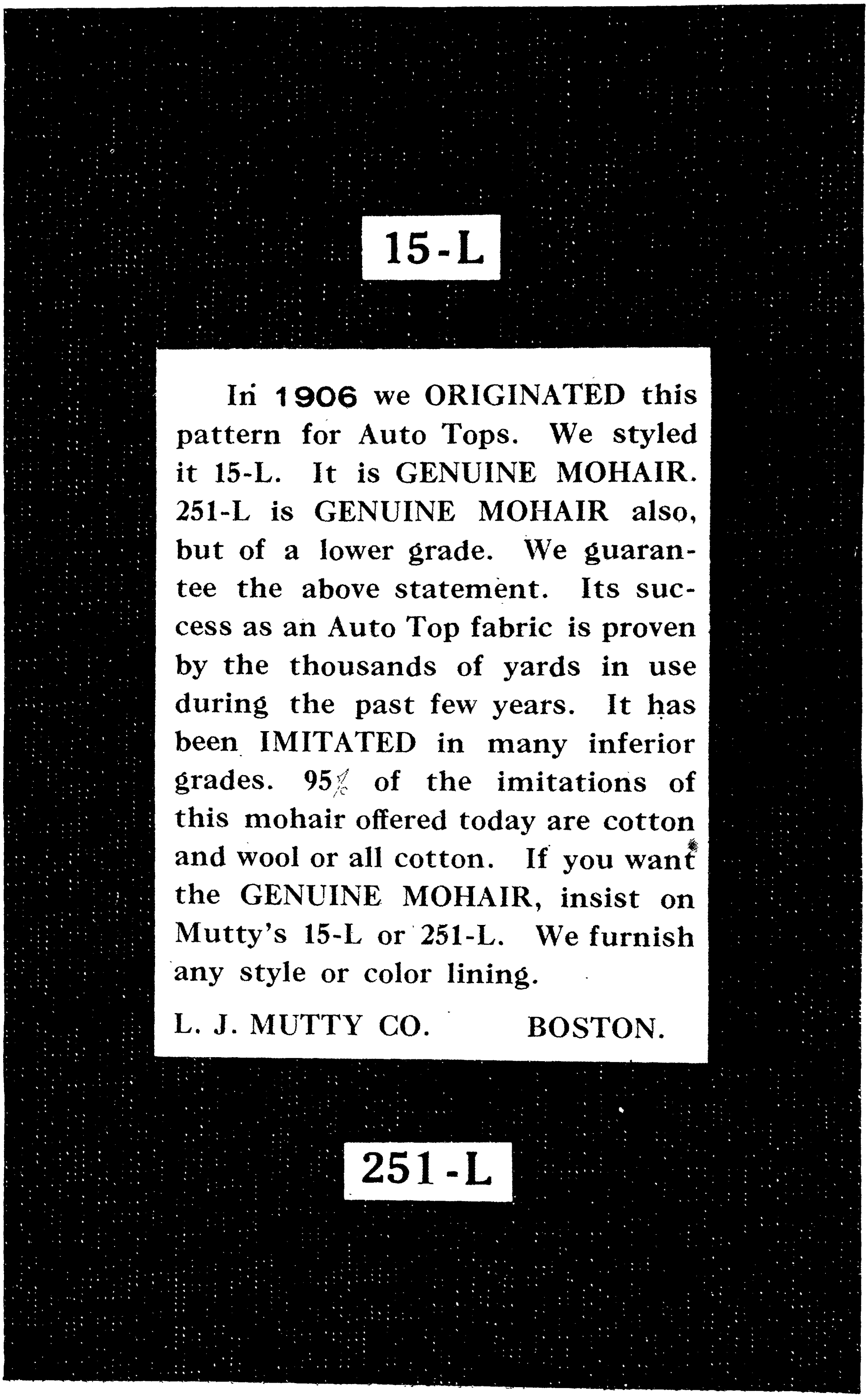


Right side of "Everitt Thirty" motor on which are only the carburetor and oil tank.

is carried on the right side of the motor, the leader being curved to permit its passing between the second and third cylinders to the inlet manifold proper. The right side of the motor is especially clean in appearance and aside from the oil supply tank and the carburetor it is free from all devices. The effect is rather pleasing to the eye and the motor has the appearance of being very well balanced. A simple and effective fan support is to be had in the motor dome plate at the forward extremity of which is a projection which is drilled out and split and retains the vertical spindle of the fan support. The fan is driven by a flat belt off an idler in communication with the half time gears and the tension is maintained and altered at will by a set screw in the dome plate bracket. The forward half of the timing gear housing is cast of aluminum a there is cast integral with it, a webb support for the crank or starting hand This forms a very rigid and light weig bearing. A large diameter stub breath is located over one of the half time gea that is on the left.

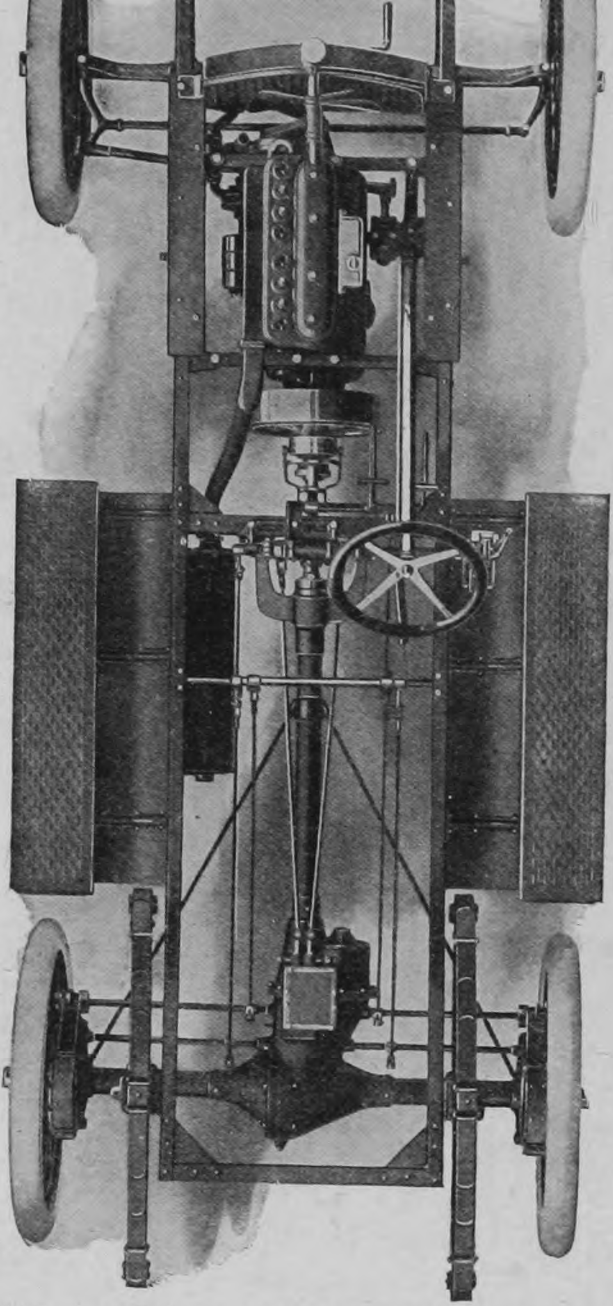
The lower section of the crank case of alminum and is virtually used simply an oil reservoir a 2-quart auxiliary oil ta being carried on the right side of the m tor. No oil pump is used and a sufficie depth of lubricant is maintained in t crank case to ensure perfect splash lubr cation of all moving members. The ha time gears run in oil ensuring quiet actio and the cam shaft, of course, being spra lubricated is certain to be well provid for.





In **1906** we ORIGINATED this pattern for Auto Tops. We styled it 15-L. It is GENUINE MOHAIR. 251-L is GENUINE MOHAIR also, but of a lower grade. We guarantee the above statement. Its success as an Auto Top fabric is proven by the thousands of yards in use during the past few years. It has been IMITATED in many inferior grades. 95% of the imitations of this mohair offered today are cotton and wool or all cotton. If you want the GENUINE MOHAIR, insist on Mutty's 15-L or 251-L. We furnish any style or color lining.

L. J. MUTTY CO. BOSTON.



Plan view of the new "Everitt Thirty" 4-cylinder car; howing the location of the different parts; note the trans- nission on the rear axle.

Magneto ignition has come to be recog- ized as standard on cars of all prices and n the season of 1910 the use of the mag- neto as the primary source of current s more marked than ever before. The tandard equipment of the "Everitt Thirty" s a high tension magneto though there is provision for recourse to the dry battery f necessity may require. The ignition ables are lead through brass guides.

Cooling is by water, the radiator being f a neat design of vertical tube. The ump, as previously stated, is gear driven ff the half time motor set and a large fan raws a current of cold air through the adiator. The jackets are of liberal di-

which he designed and built a ye ago. That is, the transmission carried on the rear axle and the thr speeds and reverse are worked in the usu manner by the side hand lever and tw long steel rods. A simple little device o viates the chance of more than one set gears being in mesh at the same tim That is, two plungers register with depre sions on the gear shift rods so that with set of gears in mesh it is impossible f them to become disengaged other than movement of the hand lever and the id set cannot be forced into communicatio with another train in action. The rea axle transmission is a feature of constru tion that has been adversely criticised, y with all, it has shown up well in hard a tual service and the best proof of it is th work it has done on other cars. There fore, in the face of absolute fact its adop tion on any car is indicative of good judg ment. The propeller shaft is of nicke steel 1⅛ inches in diameter and is house within a steel tube which also serves as torsion tube. A large steel yoke is use to retain and support the universal join from the clutch shaft to the propeller shaf This yoke also acts as a support for th brake shafts as well as for the transmissio rod. The gears are of selected alloy stee The driving axles are 1¼ inches i diameter and the wheels are keyed t the shafts. The rear wheels revolv on Hyatt roller bearings. The clutch is of the fly wheel cone type the male member being of aluminum having a two-inch face, the female member being formed in the flywheel. Eight small springs inserted under the leather facing provides for gradual and smooth pickup. Thrust is cared for by a ball thrust bearing. The torsion tube is braced by two steel rods passing from a point just back of the sup- porting yoke to the rear axle tubes, which tends to stiffen the under structure ma- terially.

There are two sets of brakes, internal expanding and external contracting, working on the rear wheel pressed steel drums. The drums are 12 inches in diameter and have a two-inch face. The brakes are actuated through steel pull rods which are adjustable. From the pedal and hand lever brake rockers the pull rods extend back to a bar extending from one side of the chassis to the other on which are carried the brake rocker shafts proper. Steel pull bars extend from this cross member to the rear axle housing. The differential housing casting

IN the six years past we have furnished Detroit automobile companies with complete front and rear automobile axles for

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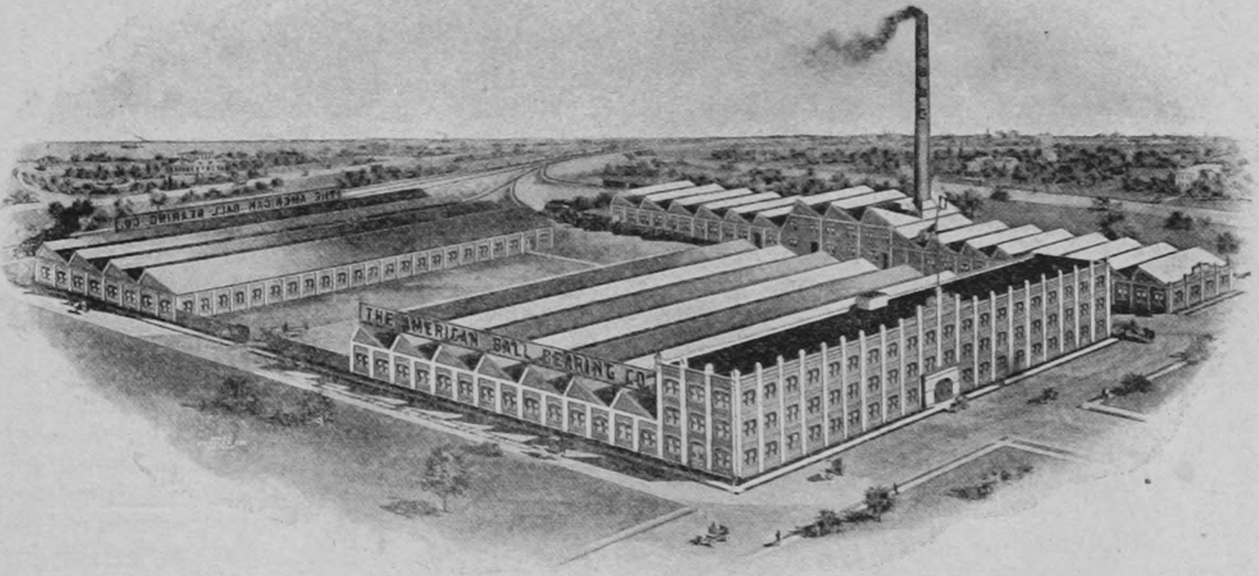
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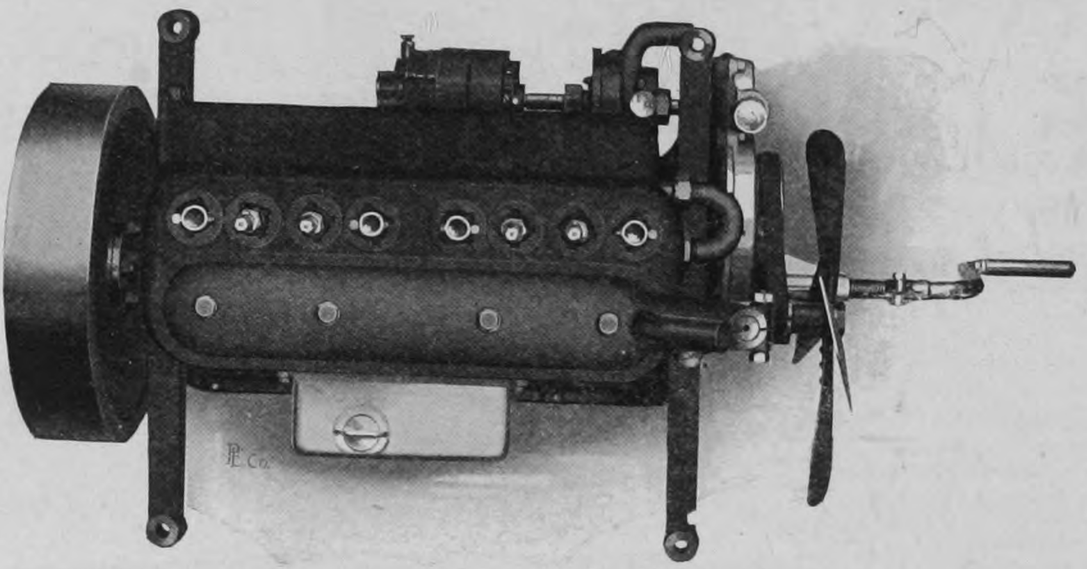
One of the snappiest and prettiest features of the "Everitt Thirty" is the double dropped frame. This is made of pressed steel hot riveted and is well cross braced and provided with gusset plates. The side members are straight and of deep channel section. They are upswept at the rear for clearance over the rear axle. The spring fronts are semi-elliptic, anchored to the frame extremities forward and to brackets on the frame side members to the rear.



Top view of the "Everitt Thirty" motor showing spark plugs and priming cups, also supporting brackets.

The front members have five graded leaves wo inches wide. The rear sets are vir-ually full-elliptic and of scroll design. hey are bolted to brackets on the chas-is side members above the rear axle ousing and to the spring sets on the rear xle tubes. The top half of the rear sets ave five leaves, two inches wide, while he lower halves are fitted with six leaves. he action is especially smooth and free.

The front-axle is of I-beam drop forged onstruction and is not dropped as is in sual practice, but is practically straight. he steering connectings are carried on a vel with the axle and well behind it. The xle itself is well back of the radiator hich adds materially to the racy appearnce of the car. Contrary to general pra-ce the spring clips go clear through the xle itself instead of the saddles. The ont wheel bearings are of the ball and one type. The steering knuckles are ushed with brass, so that where the wear curs the brass bushings compensate and e renewal of these is both simple and eap.

The cross bar and the drag link of the eering gear are of tubular steel fitted th ball and socket connections with ame provision for adjustment. The steer-

easy reach of the driver. The pedals ar of semi-stirrup design.

Wheels are 34 inches in diameer, fitte with 34x3½-inch tires. Wheel base is 11 inches and tread standard.

Pressed steel is liberally used in con struction wherever advisable. The run ning boards are of this material as ar also the brackets. The running board have a raised diamond surface, a safe guard against slipping when getting in o out of the car. The space between the running boards and the frame side members is filled in with pressed steel plates and in conjunction with the long graceful sweeping fenders the passengers are fully protected from mud or water thrown up by the tires. The bodies of the "Everitt 30's" are of pressed steel finished in the best manner possible and nicely upholstered. The foot board is given a more pronounced rake, or, much as is done in speed cars. The result is an easy footrest.

Bodies are finished in Royal Blue, which tends to set off the lines of the car to good advantage. Demi-tonneau, runabout and touring bodies are fitted according to the purchaser's desire. The Everitt is put on the market at a popular price and no attempt is made to produce it as cheap as possible, but it is built right from start to finish. Obviously, when in the new plant and with everything in working order there will be no loss of time in operations, nor should there be. With a full working force and an up-to-date equipment there is no reason why the Metzger Motor Car Company should not realize its desire to produce 25 finished cars a day. Five thousand cars is the

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—IS—
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ALL THREADS
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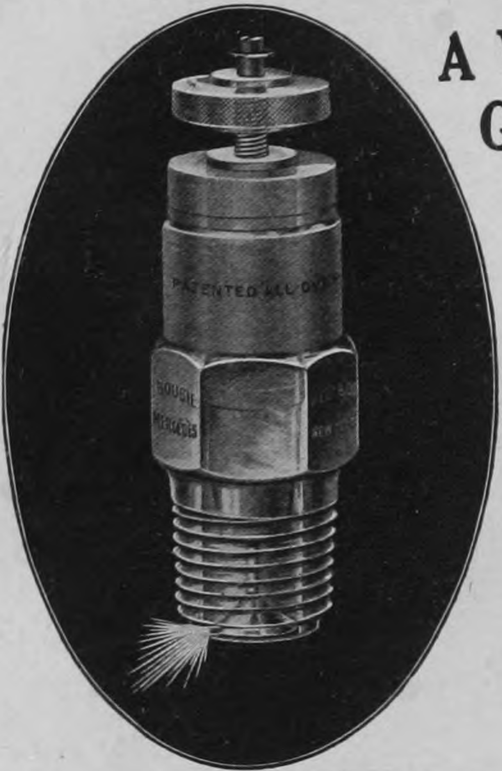

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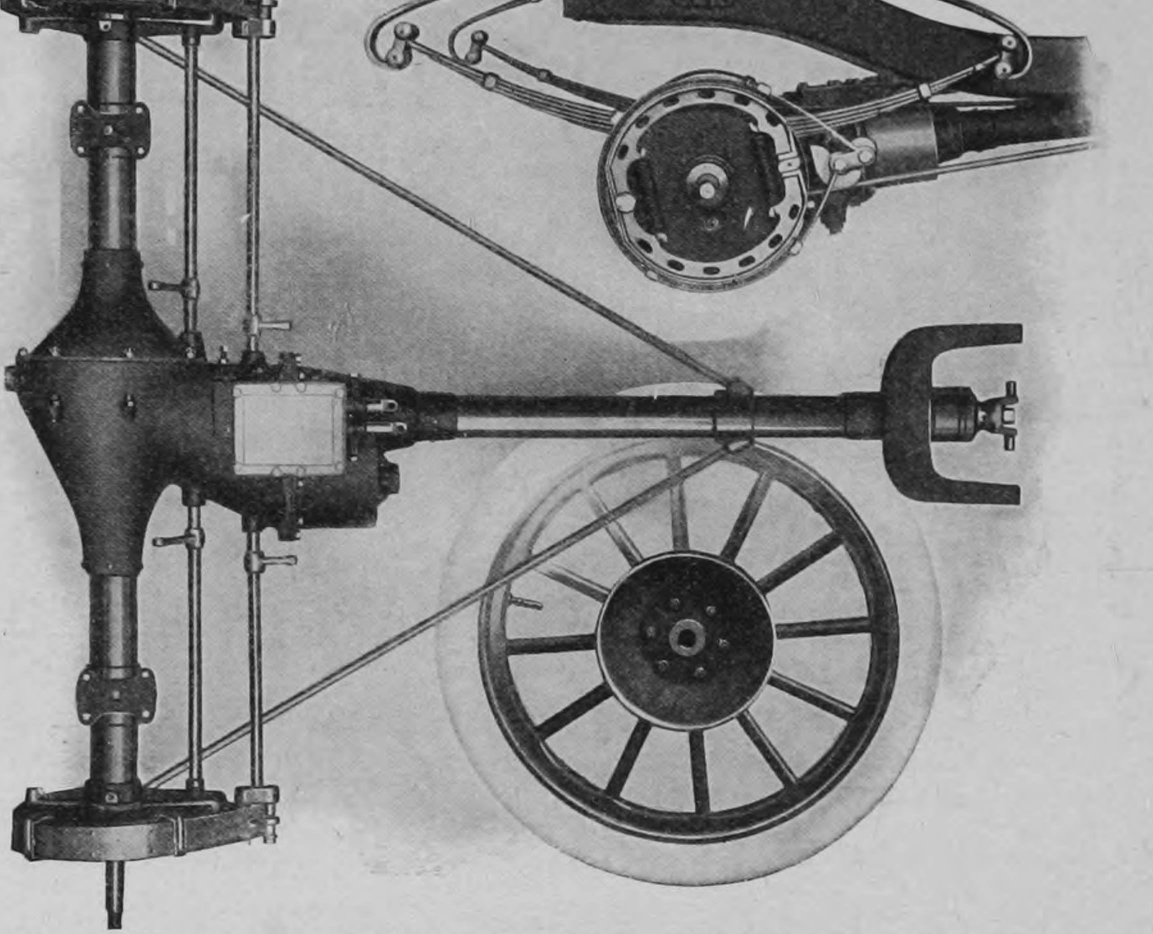


The rear axle assembly, also a view of the rear springs and brake drum with wheel removed. The transmission case is cast integral with the differential case.

the "Everitt Thirty" is one of the liveliest propositions on the 1910 market. It is the sort of a car that any man would use every day in the year in all sorts of weather and realize a good return on the investment. If one is inclined to be at all skeptical a demonstration will surely not be amiss. The motor is very sweet in performance, that transmission on the rear axle works very quietly and smoothly and the car rides comfortably. Th seats are amply commodious according t the model to accommodate two, four o five passengers without the slightes crowding, and one does not feel shake to pieces after a long ride. The spring have a smooth, sweet action, and one doe not mind the rough spots at all.

GRAND CENTRAL PALACE AUTOMOBILE SHOW.

Following the custom inaugurated last year the management of the American Motor Car Manufacturers' Association will extend a special invitation to 2200 dealers who have a rating of $50,000 or more. This, together with the thousands of automobile dealers who will attend, to say nothing of the general public, indicates another record-breaking year in the matter of attendance.

Already the management has experienced great difficulty in securing space for all the exhibitors and various plans for securing extra area have been tried. The entire 65,000 square feet, an acre and a half, of space has been allotted, and the waiting list of those who earnestly desire to ex-

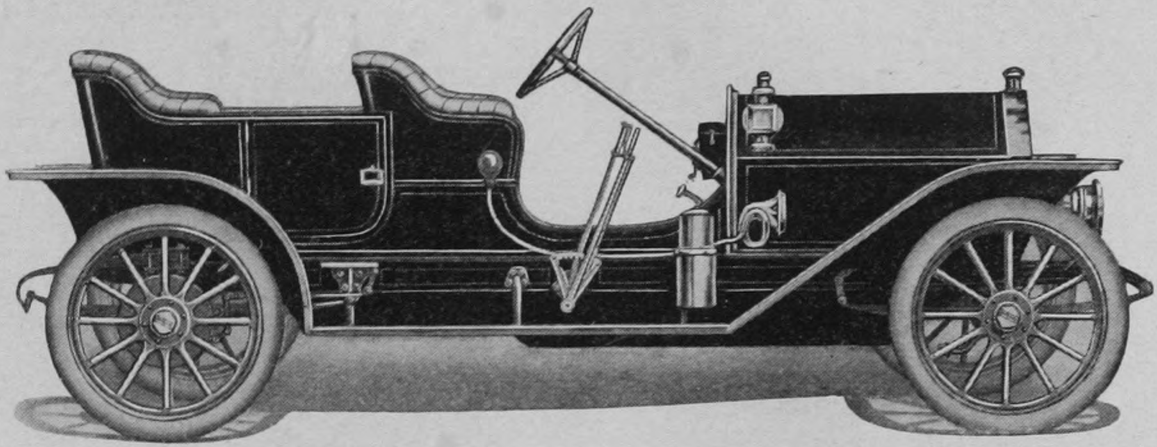
warrant the statement that not a singl preparation will be left undone before th opening on New Year's Eve.

A most interesting lecture, one of series to be given in different cities wa delievered in the Chamber of Commerce Washington, D. C., on November 16th, b Mr. Bruce Ford, of The Electric Storag Battery Co. The lecture was illustrate by lantern slides covering the care an operation of the "Exide" Battery in Electric Vehicles and was followed by a general discussion of the subject.

The Kinsler-Bennett Co., of Hartford Conn., makers of universal joints for motor cars, has elected the following officers J. McA. Johnson, president and genera manager; G. B. Kinsler, general manager

Price for This Car

Our dealers know it. They know motor car value. INTER-STATE owners realize
They have learned it from real service. Exacting motorists have determined it by actual
mparison. If you know motor car value we leave it all to you. Critical comparison will
ow you more value and greater satisfaction in the INTER-STATE car than you have
er secured in any car.



Note the extra long wheel base—118 inches—the graceful lines, the roominess of this "40" Touring Car, Model 30. It has three-quarter elliptic rear springs, giving easier riding qualities and longer life; frictionless cam action—meaning a quiet, efficient motor. All 1910 models, $1,750.

InterState "40"

The Car for Fairness

dging this car by automobile values as you have known them
-or by any car you may have in mind as your ideal—you would
rdly think we asked too much if we set the price of the Inter-
ate higher than $1,750. For no car at any price is better than
e Inter-State. We have no record of costly experiments. We
ve not been changing models year after year. So we can afford
give you the highest grade car at a moderate price—and still
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Dealers Can Bank on Its Merits

Tear Out This Reminder

Inter-State Automobile Co.
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You may send me your 1910 Catalog and information on open territory.

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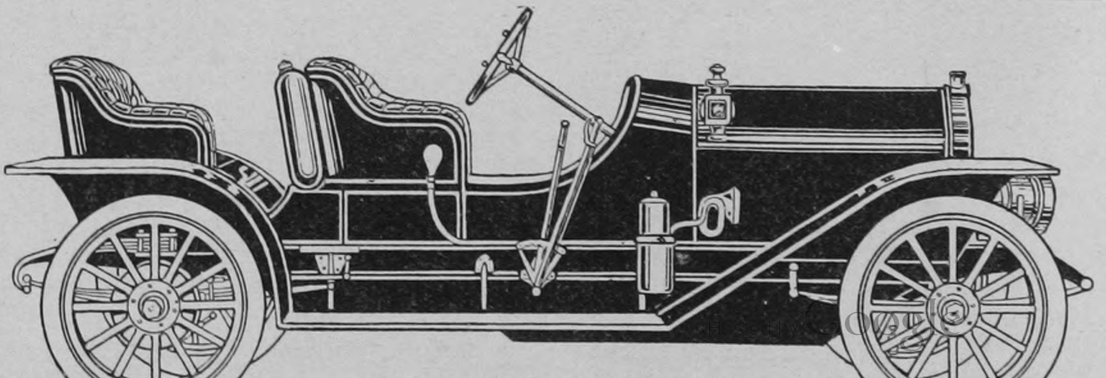
C. & A. T. J.



son, and, one whose price is well within the limitations of the average man's pocketbook, is the new Maxwell semi-racer, known as the model Q4 "Sportsman." Originally this car, which without appearing freakish in any of its lines, possesses all the rakishness of a small racing car, had been built by the Maxwell-Briscoe Motor Company for use by its various branch houses throughout the country, for competition in local races, hill climbs, and endurance runs. The sporty appearance of the car evidently made such a hit with the public that the Maxwell people decided to include this new model in its regular programme of production.

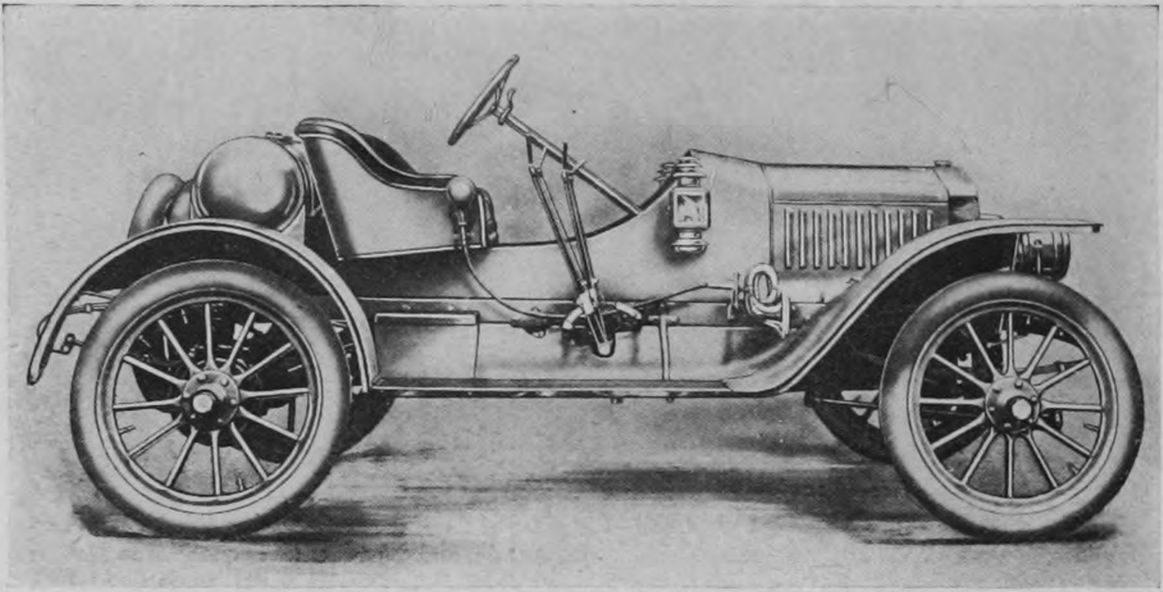


Fig. 1. The new Maxwell Model Q4 "Sportsman," a racy type car at the popular price of $1,000. Motor is 4-cylinder, 22 H. P. The hood extends backward forming a cowl and the gasoline tank is behind the seat. Cooling is by thermo syphon system and the power plant is of unit type as on the other models.

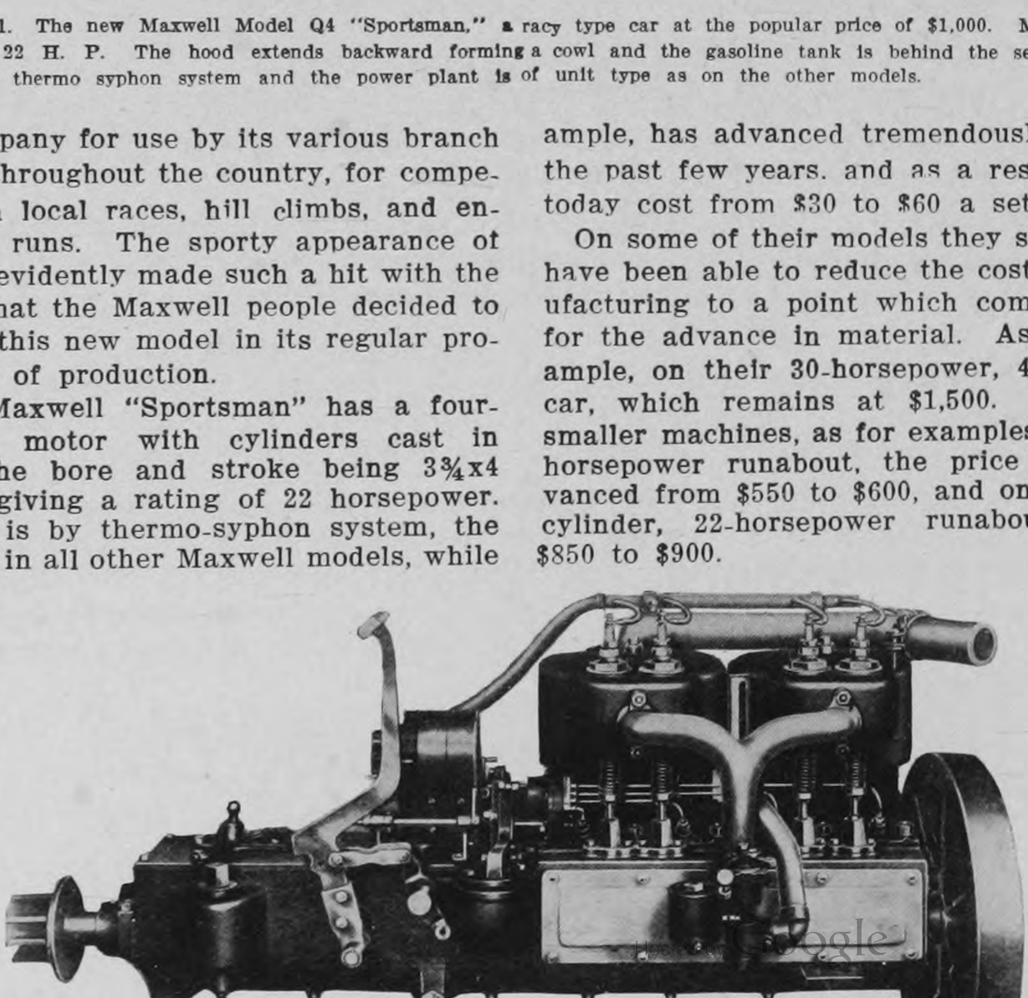
The Maxwell "Sportsman" has a four-cylinder motor with cylinders cast in pairs, the bore and stroke being 3¾x4 inches, giving a rating of 22 horsepower. Cooling is by thermo-syphon system, the same as in all other Maxwell models, while

multiple-disc clutch, unit construction the power plant, have also been retaine The price of the car is $1,000.

On November 1st, the Maxwell-Brisc Motor Company announced a rise in th prices on some of their models.

Raw material has been constantly a vancing in price. Crude rubber, for e ample, has advanced tremendously durin the past few years. and as a result, tire today cost from $30 to $60 a set more.

On some of their models they state the have been able to reduce the cost of mar ufacturing to a point which compensate for the advance in material. As, for e ample, on their 30-horsepower, 4-cylinde car, which remains at $1,500. On th smaller machines, as for examples, the 1 horsepower runabout, the price has a vanced from $550 to $600, and on their cylinder, 22-horsepower runabout, fro $850 to $900.



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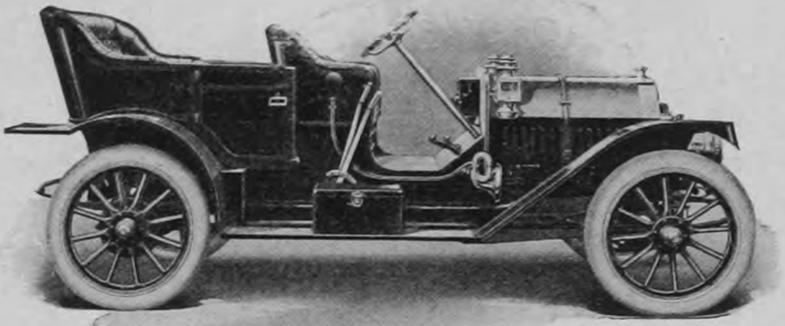
Jackson

UNIT POWER
PLANTS KEEP OIL IN
AND DIRT OUT



Model "40"

$1700

MODEL "30"—$1250. Five-passenger touring car, detachable tonneau. Four-cylinder motor, 4-inch bore, 4-inch stroke, 105-inch wheel-base and 32-inch wheels.

MODEL "40"—$1700. Five-passenger touring car or four-passenger tourabout, with detachable tonneau. Four-cylinder motor, 4½-inch bore, 4½-inch stroke, 110-inch wheel-base and 34-inch wheels.

MODEL "50"—$2350. Seven-passenger touring car. The two extra seats $50.00 additional. Also furnished as a four-passenger tourabout with detachable tonneau. Four-cylinder motor, 4¾-inch bore, 4¾-inch stroke, 120-inch wheel-base and 36-inch wheels.

In all these cars the Jackson unit power plant is used; the valves are inclined at 45 degrees in the cylinder heads and operated by overhead cam-shaft. The clutches are multiple disc and they run in oil. All models have full elliptic springs, front and rear, and the frames are dropped to bring the cars close to the ground and still allow ample spring action.

Jackson Automobile Co.
Jackson, Mich.

Members A. L. A. M. **Licensed under Selden Patent**

DISTRIBUTING AGENCIES

C. W. OATHOUT, 1663 Broadway, New York
E. P. BLAKE, 821 Boylston St., Boston, Mass.
JACKSON MOTOR CO., Kansas City, Mo.
C. H. CHILDS & CO., Utica, N. Y.
C. D. PAXSON, Cleveland, O.
RALPH TEMPLE AUTO CO., Chicago, Ill.
JOHN DEERE PLOW CO., St. Louis, Mo.

Tenth National

Automobile Show

MADISON SQUARE GARDEN

January 8 to 15, 1910, New York City

UNDER THE AUSPICES OF THE

Association of Licensed Automobile Manufacturers

Alco
Apperson
Autocar
Buick
Cadillac
Chalmers-Detroit
Corbin
Columbia
Elmore
Franklin
Haynes
Hewitt
Hudson
Jackson
Knox
Locomobile
Lozier
Marion
Matheson
Maxwell
Mercer
Mitchell
Oldsmobile
Overland
Packard
Peerless
Pierce-Arrow
Pope-Hartford
Premier
P. & S.
Reo
Royal Tourist
Sampson
Selden
Simplex
Stearns
Stevens-Duryea
Stoddard-Dayton
Studebaker E. M. F.
Studebaker-Flanders
Studebaker-Garford
Thomas
White
Winton

ELECTRIC

Anderson
Babcock
Bailey
Baker
Columbia
General Vehicle Co.
Rauch & Lang
Studebaker
Waverley
Woods

STEAM

White

Complete exhibit by the Motor and Accessory Manufacturers. The only complete Motorcycle exhibit in New York, by the Motorcycle Manufacturers' Association, Commercial Vehicles, Town Cars and Taxicabs.

The . . .

"Great January Special"

will be the greatest number ever published of the great

CYCLE AND AUTOMOBILE TRADE JOURNAL

(Published in Philadelphia)

What makes the January Issue a Great Special Number?

The Buyers' Descriptive Index (The year-book of the trade)
The Big Show Number and
The Directory Service Number

It so happens that all these important features come in the one issue, hence the term

"Great January Special"

A triple value for the advertiser,
BUT NO ADVANCED RATES

For full information read the seven following pages

WHAT IS THE
"*Big Show Number*"?

¶ Each year always has one big Show issue and the

CYCLE AND
AUTOMOBILE
TRADE JOURNAL
(Published in Philadelphia)

is the one publication which is always it. This year it will be the January Edition and those advertisers who are favorable toward Show Numbers will get better service and better satisfaction from our JANUARY BIG SHOW ISSUE than from any other issue of any other publication, because it will be this year what it has always been—biggest and best.

¶ The exhibitors who are at the largest Shows are always better satisfied with results than those who attend the small ones. This is because of the universal rule that where there are the most sellers there must also be the most buyers. This holds true when it comes to advertising mediums, for where there are the advertisements of the most sellers, there are the most readers who are buyers.

¶ This feature, therefore, makes additionally valuable the "GREAT JANUARY SPECIAL," on account of the "BIG SHOW NUMBER" feature.

WHAT IS THE "Buyers' Descriptive Index?"

IT IS A NEW FEATURE OF THE "*Great January Special*"

of the

CYCLE AND AUTOMOBILE TRADE JOURNAL

(Published in Philadelphia)

¶ It is the development of years of experience and is what we know to be of the greatest value to buyers. It is truly an indispensable reference book.

¶ The "Buyers' Descriptive Index" is an improvement on the old and well-known features which have each year made the January number of the Journal of such great value, and with the added feature, such as descriptions and prices, the coming January number can justly be termed "the year-book of the trade." A glance at the two sample pages following will demonstrate the value of the "Buyers' Descriptive Index." It is a classified list of all the products of each advertiser, giving the essential points of merit of each article, and also (whenever possible) the list price. In brief, it is a convenient buying reference in condensed form.

(*See sample forms on next two pages*)

SAMPLE PAGE

The Buyers' Descriptive Index

LAMPS

Badger Brass Mfg. Company, Kenosha, Wis.

Generator Head Light, parabolic aluminum reflector, 7 in. between prop centres, No. 951, $5.50.

Generator Head Light, parabolic aluminum reflector, 7 in. between prop centres, No. 951a, $6.75.

Generator Head Light,, No. 951, with silver reflector and electric bulb, lens 6⅞ in., height 9 in., $10.00.

Generator Head Light, No. 951e, silver reflector and adjustable electric bulb, $12.50.

Junior Oil Lamp, No. 805, height 9½ in., 3 in. rear ruby glass, aluminum reflector. Price $3.50

Junior Side Lamp, No. 820, height 11½ in., front glass 5¼ in., rear 1½ in. ruby, aluminum reflector. Price $3.75.

Junior Square Side Lamp, No. 833, height 12½ in., front glass 4¼ in., rear ruby 1½ in. burnished silver linings, $6.50.

Junior Square Side Lamp, No. 833c, electric and oil, height 12½ in., 4½ in. front glass, 1½ in. rear ruby, $8.50.

Lens Mirror Search Light, No. 857, lens 8 1-16 in., height 10 in., $10.50.

Lens Mirror Projector, No. 887, 7 in. B. & L. Lens Mirror, $17.50.

Lens Mirror Search Light, No. 956, lens 6⅞ in., height 9 in., $7.50.

Lens Mirror Search Light, No. 958, lens, 9 in., height 10 in., $14.00.

Mirror Search Light, No. 956a, lens 6⅞ in., height 9 in., $8.00.

Lens Mirror Search Light, No. 959, $21.50.

Lens Mirror Projector, No. 887, 7 in. B. & L. Lens Mirror, $17.50.

Lens Mirror Projector, 8 in. B. & L. Lens Mirror, No. 989, $25.00.

Mirror Search Light, No. 956a, $8.00.

Mirror Search Light, No. 957a, $11.50.

Mirror Search Light, No. 958a, lens 9 in., height 10 in., $15.00.

Mirror Search Light, No. 959a, $23.00.

Motor Car Search Light, No. 867, 7 in. B. & L. Solar Lens Mirror, $16.50.

Motor Car Search Light, No. 868, 8 in. B. & L. Solar Lens Mirror, $19.50.

Motor Car Search Light, No. 869, 9 in. B. & L. Solar Lens Mirror, $28.50.

Search Light Side Lamp, height 14 in., front glass 6 7-16 in., rear 1½ in. ruby, aluminum reflector and door lining, No. 824a. Price $5.00.

Search Light Side Lamp, No. 824a, optical lens, height 14 in., front glass 7 7-16 in., rear 1½ in. ruby, aluminum reflector and door lining. Price $5.50.

Senior Oil Tail Lamp, No. 806, 13½ in. high, aluminum reflector, rear ruby semaphore 3½ in. Price $5.00.

Senior Oil Tail Lamp, No. 806c, electric and oil, 13½ in. high, aluminum reflector, ruby rear semaphore 3½ in., $7.00.

Senior Square Side Lamp, No. 835, height 13½ in., side glass 4⅝ by 4¼, front glass 4⅝ in. square, rear 2 in. ruby, burnished silver lining, $9.00.

Senior Square Side Lamp, No. 835c, 13½ in. high, 4⅝ in. square front glass, rear 2 in. ruby, burnished silver linings, electric and oil, $11.00.

Solarclipse Headlight, No. 850s, 9 in. Plano Convex front lens, 8 in. B. L. S. Lens Mirror Reflector, $45.00.

Solarclipse Headlight, No. 850s, 9 in. Plano Convex front lens, 8 in. B. & L. Lens Mirror Reflector, $57.50.

Square Oil Tail Lamp, No. 930, height 12 in., rear glass 3½ in. ruby. Price $5.50.

Square Oil Tail Lamp, No. 930c, electric and oil, 12 in. high, rear glass 3½ in. ruby, $7.50.

Taxicab Square Side Lamp, No. 932, height 11½ in., front glass 3⅞ in. rear ruby 1 in., burnished silver linings, $5.50.

Rose Manufacturing Company, 910 Arch Street, Philadelphia.

Forced Draught Square Side Oil Lantern, No. 82. Same as Lamp No. 83, except that it has full silver linings and no mirrors. Can be equipped for acetylene gas if desired.

Forced Draught Square Side Oil Lantern, No. 83. Black lining, with double concave Mirror Lens Reflectors. Burns kerosene oil. Lamp is full brass, extreme height 13½ in., polished and beveled front light, 5 in. x 4½ in.; polished and beveled side light 5 in. x 4¾ in.

Medium Sized Side Oil Tubular Lamp, No. 54, diameter of face 5¼ in., extreme length 7⅝ in., extreme height including bale 14½ in., burning capacity 30 hours (kerosene oil), equipped with non-breakable double concave mirror lens reflectors.

Mangin Mirror Searchlight Projector, Pilot House Type, No. 127. Made in 5 sizes, 6, 7, 8, 9 and 10 inches.

Mangin Searchlight Projector, Deck Type, No. 126. Made especially for launches, motor boats and marine work, five sizes, 6, 7, 8, 9 and 10 inches.

Mirror Lens Oil Lamp. Double concave mirror lens reflectors and double convex side lens. Dia. of face 6⅝ in., extreme length 8¼ in., burns kerosene oil.

Search Light Projector, Auto Dash Type D, Double Focus with swinging swivel bracket, three sizes, No. 79d, small size, No. 88d, medium size, No. 99d, large size. Same lamp is used as the regular double focus search light.

Single Focus Mangin Mirror Lens Search Light Projector, full brass, highly polished, No. 107, 8⅝ in. long, 9¾ in. extreme height, 8½ in. dia. of face, 6¾ in. dia. of body. No. 108, length 10¼ in., extreme height, 10¾ in., dia. of face 10 in., dia. of body 7¾ in. No. 109, length 11¼ in., extreme height 11¾ in., dia. of face 10½ in., dia. of body 8¾ in. No. 110, length 11½ in., extreme height 13 in., dia. of face 12¾ in., dia. of body, 10 in.

Double Focus Search Light, 2-flame burner, double concave mirror lens reflector, for acetylene gas, No. 79, small size, 8½ in. face, 9½ in. height, dia. of body 6½ in., length 8½ in. No. 88, medium size, dia. face 10 in., extreme height 10¾ in., length 10 in., dia. of body 7¾ in. No. 90, large size, dia. of face 10½ in., extreme height 11½ in., length 10 in., dia. of body 8¾ in.

Motorcycle Gas Lamp for separate gas generator, dia. of face 6 in., length 6 in., extreme height 7¾ in.

Bicycle and Motor-cycle Oil Lamp made in nickel, brass or gun metal finish, provided with a ruby rear light.

Search Light with Mirror Lens Reflector, made in three sizes (for rigid brackets) non-breakable mirror lens reflectors, full brass. Highly polished, No. 6-F, small size, dia. of face 8½ in., length 8¼ in., dia. of body 5¾ in. No. 15-A, medium size, dia. of face 8½ in., extreme height 9½ in., length 8½ in. dia. of body 6½ in. No. 108A, large size, dia. of face, 10 in., extreme height 10⅝ in., length 10 in., dia. of body 7¾ in.

Tail Oil Lamp, No. 53, small size, length 5 in., width 4½ in., dia. of face 4¾ in., dia. of danger signal 2¼ in., extreme height including bale 9¼ in., burning capacity 24 hours (kerosene oil).

SAMPLE PAGE

The Buyers' Descriptive Index

Force Draft Automobile Tail Lamps, No. 60, large size, height 12 in., lens 5½ in., width 6½ in.

Force Draft Automobile Tail Lamp, No. 84, equipped with red, green and white lenses, extreme height 10¾ in., dia. of face 4 in., dia. of rear danger signal 3 in., dia. of green side light 3 in., width of lamp, 6½ in., depth of lamp 5 in.

MAGNETOS

J. S. Bretz Company, Times Building, New York City.

U. & H. High Tension Magneto, Type LB, for 4, 6 and 8-cylinder motors, annular ball bearings throughout, all parts easily cleaned, adjusted or removed.

Heinze Electric Company, Lowell Mass.

Heinze Type E, Low Tension Magneto for operating through vibrating spark coils to plugs, $40.00.

Hercules Electric & Mfg. Co., Indianapolis, Ind.

Wizard Tubular Magneto for contact or wipe spark, Type B, length 10 in., height 7 in., weight 10 pounds, belt or friction drive, $15.00; with governor, $16.50.

Herz & Company, New York City.

Herz High Tension Magneto, Model 6H1, for 1-cylinder up to 8 H. P., $55.00; 6H2, 2-cylinder up to 16 H. P., $65.00; 6H4, 4-cylinder up to 30 H. P., $100.00; for motorcycles, 3H1, 1-cylinder up to 3 H. P., $38.00; 4H1, 1-cylinder up to 6 H. P. and larger, $45.00; 4H2, 2-cylinder at 180 deg. up to 6 H. P., $50.00; 4H2V, 2-cylinder set in any angle, up to 6 H. P. and larger, $42.00.

Hess-Bright Mfg. Co., 2102 Fairmount Ave., Philadelphia.

Hess-Bright High Tension Magneto, for 4-cylinder motor, gives efficient spark at 40 r. p. m., has a range of spark advance of 65 degrees.

K-W Ignition Company, Cleveland, Ohio.

Model A, jump spark, belt or gear drive. Price $35.00.

Model AM, make and break spark. Price $35.00.

Model C, jump spark, belt or gear drive, $45.00.

Model CM, make and break spark, $45.00.

Model D, friction drive, jump spark. Price $35.00.

Model F, belt drive or jump spark made especially for Ford Runabout, $35.00.

Motor boat special, Model M, jump spark. Price $35.00.

Lavalette & Company, 112 W. 42nd St., New York City.

Eisemann High Tension Magneto, Model EK, for 4-cylinder engines driven by gear wheel or cardian joint or by chain; for either 2-cycle or 4-cycle engines.

J. H. Lehman Mfg. Co., 170 Broadway, New York City.

Fulmina Magneto, gives hot spark at 100 r. p. m., heavily constructed circuit breaker.

Mavity-Sleeper Company, Fowler, Ind.

M. & S. Magneto, low tension type, has a narrow commutator of large diameter built of 24 segments.

Witherby Igniter Company, 1876 Broadway, New York City.

Volta High Tension Magneto, 4-cylinder type, $100; 6-cylinder type, $120.

Remy Electric Co., Anderson, Ind.

Remy High Tension Alternating Current Magneto. Type H. B. Complete unit within itself; timing device and means of distributing current to different cylinders, contained within apparatus.

Remy High Tension Alternating Current Magneto. Type L. for 4-cylinder motors.

Remy Low Tension Alternating Current Magneto, Type R. B. This type requires no spark coil or battery, whether used with engines with single or multi-cylinder type.

Remy Magneto Dynamo Ignitor, Type W1, for either make and break or jump spark ignition, fitted with a governor.

Remy Magneto Dynamo Igniter, Type W2, for use with large engine where it is impossible to turn engine over quickly for starting or where engines are started by pulling back against compression and operating a sparker by hand.

TIRES

Note.—The prices quoted in the accompanying list are for the same sized tire in each case, namely 32x3½ for automobile tires and 26x 2¼ for motorcycles. Prices include casings and inner tubes.

Continental Caoutchouc Company, 1788 Broadway, New York City.

Continental Original Flat Tread, Automobile, $41.25.

Continental Original Wrapped Tread, $46.30.

Dayton Rubber Mfg. Co., Dayton, O.

Dayton Airless Clincher Tire, $65.00.

Ennis Rubber Mfg. Co., Commercial St., Newark, N. J.

Ennis Motorcycle Tire, $12.00.

Ennis Automobile Tire, $27.97.

Fisk Rubber Company, Chicopee Falls, Mass.

Fisk Double Tube Motorcycle, $11.00.

Fisk Plain Tread, bolted-on tires, $35.05.

Fisk Quick Detachable Clincher, heavy car type, plain tread, $27.00.

Fisk Regular Clincher, plain tread, heavy car type, $31.75.

Fisk Regular Clincher, heavy car type, flat tread, $34.75.

Fisk Regular Clincher, heavy car type, Bailey tread, $34.75.

G & J Tire Company, Indianapolis, Ind.

G & J Bailey Tread Motorcycle Tires, $23.05.

G & J Race Tread Motorcycle Tires, $11.25.

G & J Round Tread, Automobile, regular clincher, $28.90.

G & J Round Tread, Automobile, Dunlap Type, $28.90.

G & J Round Tread, Automobile, Quick Detachable,, $28.90.

G & J Regular Clincher, Bailey Tread, Dunlap and Quick Detachable, Automobile, $30.95.

Morgan & Wright, Detroit, Mich.

M. & W. Bailey Tread, $30.95.

M. & W. Heavy Flat Tread, $30.20.

M. & W. Regular Round Tread, Automobile, $28.90.

Pennsylvania Rubber Co., Jeannette, Pa.

Pennsylvania Corrugated Tread, Motorcycle Tire, $10.60.

Pennsylvania Non-Skid Tread, Motorcycle, $11.85.

Pennsylvania New Flat Tread, Motorcycle, $13.10.

Pennsylvania Steel Studded, Non-Skid Motorcycle Tire, $21.85.

Samson Leather Tire Company, 1634 Broadway, New York City.

Samson Cape Noire Leather, $63.00.

Samson Round Tread, $43.00.

Samson Type Coarse Leather, $63.00.

WIND SHIELDS

Limousine Carriage Mfg. Co., Michigan Ave. and 35th St., Chicago, Ill.

Beecher Divided Windshield, standard size, 33 in. high, 40 in. wide, bottom 6 in. wide, mahogany finish $50.00, full brass $70.00.

Schildback Divided Windshield furnished for any make of car, standard widths, 40, 42,

The Buyers' Descriptive Index—(continued)

¶ The sample forms on the preceding pages were made up of several different articles, to show the treatment of different subjects, and are intended to show only a very small portion of the matter which will appear under the various headings.

¶ In limiting the "Buyers' Descriptive Index" to those manufacturers who are advertisers in the JOURNAL, we are making it more valuable, for the reason that all of the prominent and representative manufacturers are regular advertisers in the JOURNAL, and therefore the information will be free from dead matter, being practically confined to all the live companies in the trade.

¶ This feature adds to the time-saving qualities of the Buyers' Index, as much time is wasted ordinarily in seeking information about the product of manufacturers who are but slightly connected with the trade, or who are only manufacturers in a small way.

¶ Another point is that the advertisements will give additional information to that contained in the "Buyers' Descriptive Index," and therefore after the Index has been used for reference in the form of a synopsis, the buyer can from the advertisers' index turn to the more complete and illustrated information which is found in the advertising pages.

¶ The descriptive feature of the Index must necessarily be very much condensed and without illustrations, so it will not become too bulky. In consequence of this feature the advertisements in this issue will be of added and lasting value.

WHAT IS THE

"Directory Service... Number?"

¶ This feature of the "GREAT JANUARY SPECIAL" is one which should commend itself to every advertiser, for it is a very valuable service rendered without additional cost to annual advertisers having large spaces.

¶ **IT IS THIS—Every advertiser who has a yearly contract and uses a quarter page or more in the January issue of the Journal, will have the same advertisement repeated FREE OF CHARGE in the January Directory.**

Our Directory, which bears the title:

MOTOR CYCLE, MOTOR BOAT &
AUTOMOBILE
TRADE DIRECTORY
(Published in Philadelphia)

is universally recognized as being the authoritative publication of its kind. It is the most accurate and complete automobile directory in the world. In addition to the regular Directory classifications, with the names and addresses of the manufacturers under the headings of the products they make, are a number of valuable features, such as the Brand Classification. This was originated by us, and is exclusively ours. Its merit will soon result in its being universally copied. Many a buyer knows the name of a product, but not the manufacturer. By referring to the brand list this information is instantly obtained.

¶ In each issue of the Directory are illustrated descriptions of the new automobile machinery and tools; the names of all Trade Associations, together with the names of officers, members, etc.; various formulas and tables of use to every manufacturer, dealer and others. These are a few of the many features contained in this valuable Directory. Therefore, the advertiser will fully comprehend that when this service is given him without additional cost, if he is an annual advertiser and has large space in the GREAT JANUARY SPECIAL, he is obtaining more than full value.

¶ Seldom are such important features found in any one number of a publication.

"The Buyers' Descriptive Index"

"The Great Show Number"

"The Directory Service"

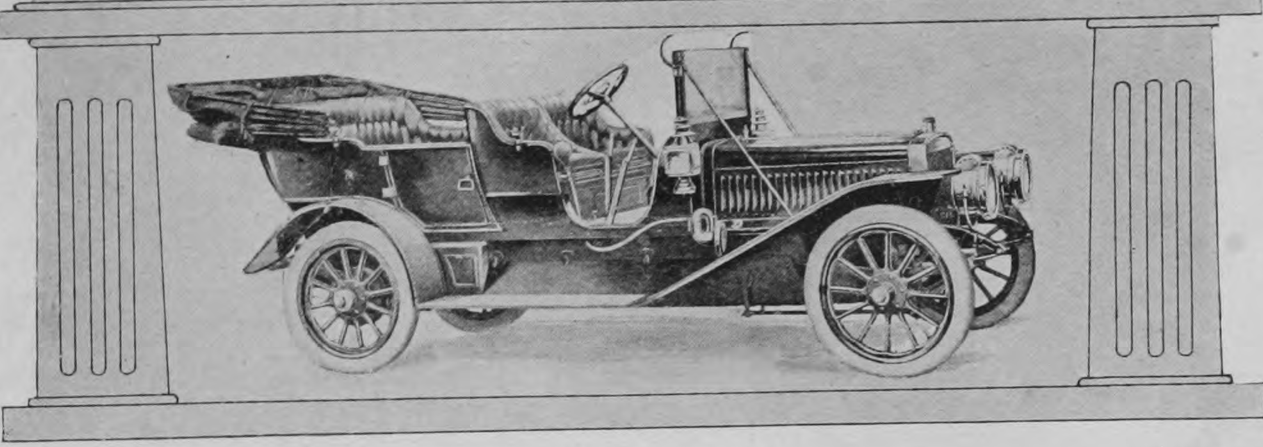
All Combined in the
January Issue
of the
CYCLE AND
AUTOMOBILE
TRADE JOURNAL
(Published in Philadelphia)

¶ This number is the great yearbook of the trade and will be used as a reference book throughout the entire year. The GREATEST number of the GREATEST publication in the automobile field.

¶ Triple value without advanced rates.

¶ It is the advertiser's opportunity.

THE WINTON SIX



BY D. SCRIBER.

The 48 H. P. Winton Six, now in its third season, and manufactured by the Winton Motor Carriage Co., Cleveland, O., shows remarkably few changes for 1910. Most important of the new features is a four-speed transmission and an enlarged multiple disc clutch. In explaining this change, the company states that the motor, which is identically the same as last year, was found capable of performing more work than had been asked of it, and that the new fourth speed will utilize this excess power, this speed being geared up. The ratio of the first three speeds remains unchanged from last year, and the motor drives direct on third as before. The clutch has been enlarged in diameter to insure the delivery of highest power to the driving wheels.

Among the incidental improvements for 1910 is an inswept frame, which permits the car to be turned in short radius. Thi is all the more desirable now, inasmuch a the wheel base has been lengthened to 12 inches, as against 120 inches last year The additional space thus provided in th body affords the passengers more than ordinary foot-room, both in front and back The body is wider than before, and has low, rakish look. The low effect has bee gained by the use of semi-elliptical spring without scroll. The new car carries fou shock absorbers and four rubber bumpers as well as jump straps.

The new car is characterized by a fron axle of channel-section pressed steel, o new design. Lubrication is by force feed as in 1909, and ignition is by Eisemann magneto, with storage battery t supply auxiliary current for starting. Th carburetor represents the result of M Winton's long experience in carbureto

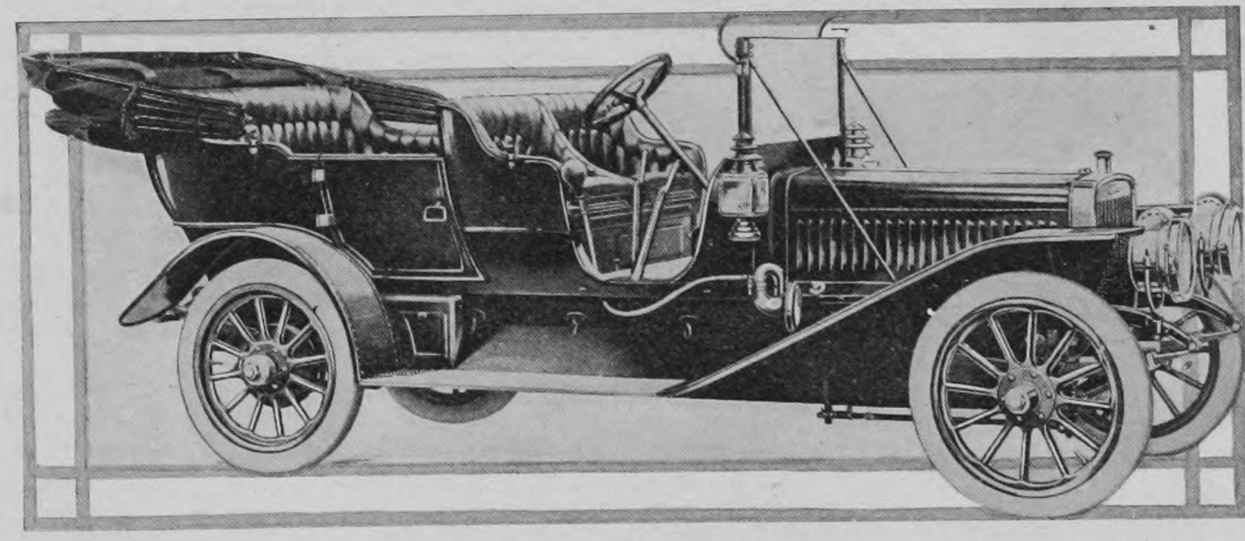


Fig. 1. The 1910 Winton Six, wheel base, 124 ins.; tread, 56½ ins.; tires, 34 x 4 front, 34 x 4½ rear, motor, 6 cyl., 48 h. p., 4½ in. bore; 5 in. stroke, dual ignition system by Bosch or Eisemann high-tension magneto and storage battery and single non-vibrating coil, force-feed lubrication by two eccentric pumps, multiple disc clutch runs in oil in the same case as the transmission which is of the selective sliding gear type, four speeds forward and reverse with direct drive on third; two internal expanding and two external contracting brakes, semi-elliptic springs [illegible] channel-section front axle, full floating rear axle, Timken roller bearings through

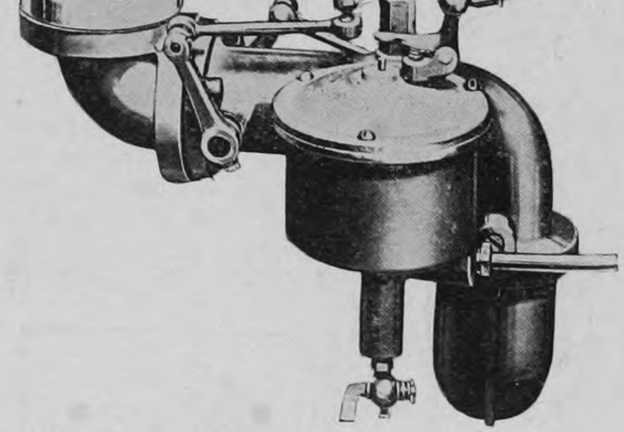


Fig. 2. The "Winton" Single-nozzle Carburetor.

work. It is of the single-nozzle type, without auxiliary air inlet, and is equipped with two throttles, which work in combination. The carburetor may be primed from the dash. The spark and throttle levers have been lengthened, while the steering wheel has been equipped with a hard rubber rim.

At the purchaser's option the car will be fitted with long or short pedals for clutch and brake, and when desired the gear change and brake levers will be placed nearer the seat than on standard equipment. The radiator is of handsomer design than before, and in making this change the radiator tubes were slightly lengthened, as was also the filler. The filler cap is of hard rubber. Solid brake spiders and increased brake leverage are new features. The oil tank has been enlarged, as has also the front universal joint, which is equipped with a lubricant retainer. There are oil cups on the springs. Running boards and guards are wider than before. Rear guards drop over the wheels. Running boards and front floor are covered with pressed aluminum of pyramid design.

The body is of new design, with bucket seats in front, and ample room for three on the rear seat. Large enough to carry seven, the body will be fitted with auxiliary seats when specially ordered.

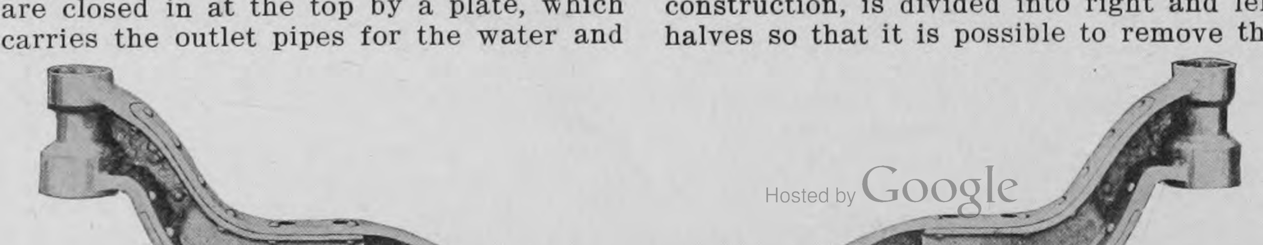
THE SIX CYLINDER MOTOR

The motor of the 1910 "Winton Six" has been continued practically the same as last year. The cylinders are cast in pairs with integral water jackets. The water jackets are closed in at the top by a plate, which carries the outlet pipes for the water and
prevent cracking of the jackets. The cy
inders are 4½-in. bore by 5-in. stroke, gi
ing an A. L. A. M. rating of 48.6 H. P.
noticeable feature of the Winton constru
tion is the very thorough manner in whic
every moving part has been housed, pr
tecting these parts from dust and dirt. A
the gears at the front, including the fa
driving mechanism, are completely house
as are also the valve push rods, valv
stems and springs; yet all of these par
are in reality very accessible owing to th
liberal use of large handhole plates. Th
very workmanlike manner in which th
wiring and small pipes are arranged is al
noticeable at a first glance. These fe
tures are shown in the accompanying i
lustrations of the motor. The crank cas
as usual, is an aluminum casting. A
though the cylinders are cast in pairs, th
water jackets completely surround each i
dividual cylinder. The cylinders are fi
ished by grinding and are offset from th
crank shaft, equalizing the side thrust o
the cylinder walls. The cylinders are su
mitted to a hydraulic test of 300 pounds
the square inch. The connecting rods a
long, reducing the angularity and cons
quently the side thrust. The pistons a
also very long and fitted with three e
centric rings, assuring in connection wit
ground cylinders; good compression. A
tention is given to making all piston
rings, connecting rods, and wrist pins o
the same weight, thus assuring perfect ba
ance.

The cam shaft is of liberal size an
mounted in bearings, the surface of whic
are ground. A single cam shaft is use
operating all of the interchangeable, larg
sized, nickel steel valves. All cam sha
gears are enclosed. These are of steel, a
well as those driving the fan and are o
the spiral type, to reduce the noise. Th
cam shaft is removable through the fron
of the case without removing the valv
springs, push rods, or rollers, or destroy
ing the valve adjustment.

The six throw crank shaft is made o
specially treated nickel steel, of abou
125,000 pounds per square inch tensil
strength. This shaft is mounted in fou
large Parsons' white brass bearings.

The crank case, as in previous Winto
construction, is divided into right and lef
halves so that it is possible to remove th



accessories. A drain is supp
bottom for flushing out the oil chamber.

THE SELF-STARTER.

An exclusive and valuable feature of the "Winton Six" is the compressed air, self-starting device. The Winton carries its starting crank in a tool box to be used only in emergencies, the same as other tools; the arrangement is simple but effective. A small pressure tank placed between the left frame rail and the driving shaft is charged by means of small portions of the gas from cylinders one and six. Here the pressure is stored until needed to start the motor. By turning a small cock this gas flows through a rotating distributor, forcing one of the pistons down and at the same time one of the other pistons passes the firing point, and the motor starts. If for any reason this cylinder fails to fire the distributor sends the pressure to the next cylinder in order and thus forces the next piston past the firing point. This process continues through the series of cylinders several times until the motor starts. There is but one moving part, the distributor valve, which is readily lubricated and, it is said, practically never gets out of order.

A slight click in the gauge on the dash has been eliminated in the 1910 models by the use of a small check valve which is placed vertically in the air line. On the dash are arranged the pressure gauge, which shows the pressure in the tank, a push button, which allows pressure to flow to the cylinders, and a shut off valve, for use when the car is to remain idle for a long time, thus preventing the escape of pressure from the storage tank.

on the dash and the other end can be co
nected to any tire to be inflated.

CARBURETOR.

The carburetor is of the float feed, si
gle nozzle, but double throttle type; that i
a throttle controls the air inlet and wor
in unison with a throttle controlling t
flow of gas to the engine. There is no a
tomatic air valve. Throttling is done m
chanically by lever from the steeri
column, or by a foot button, which acts
an accelerator and is located under t
driver's right foot. A priming device
also placed conveniently on the dash.

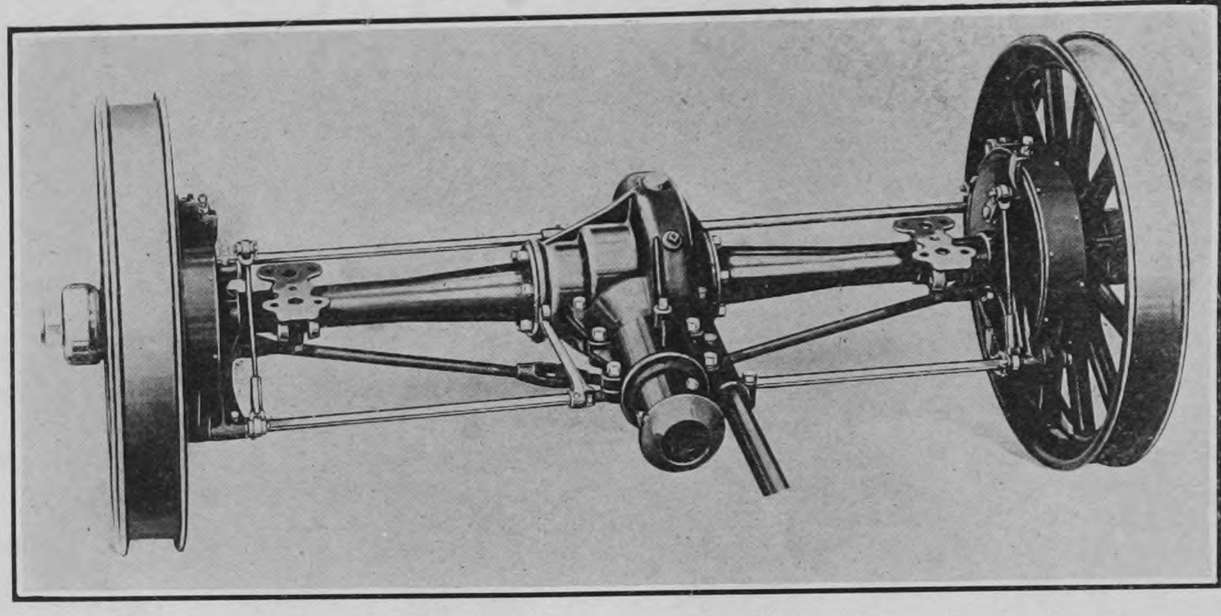


Fig. 4. The full floating Winton rear axle.

LUBRICATION.

The crank shaft receives oil by means
a pump operated by an eccentric on t
rear end of the crank shaft; oil bei
drawn by a tank at the left side of the m
tor and delivered to the main bearin
and to the front gears. A continuous sig
feed is placed on the dash. The overfl
from the main bearings provides a spla
pool, which takes care of the cylinde
and a second pump, operated by the sa
eccentric, draws oil from the case a
passing it through a strainer retu
it to the oil tank. The flow of
is proportionate to the motor speed a
the quantity is regulated by a by-pass.
grooves in the cylinders and pistons d
tribute the oil on the cylinder walls.

THE CLUTCH.

The transmission gears and the multi
disc clutch, in accordance with appro
practice, operate in an oil bath. T
clutch is tested to transmit 90 H. P.
1000 R. P. M. It has sixty-seven steel fr
tion plates, thirty-three of which are

there is no end thrust on the bearings when the clutch is engaged. The discs are forced together evenly by four springs, placed at equal distances. A clutch is contained in the transmission case and is accessible through a handhole. An arrangement is made so that the clutch pedal cannot be locked with the clutch out of engagement, thus making it compulsory to place the cars in neutral position when stopped. The clutch and hand brake are inter-connected. The clutch mechanism is compact, requires but slight foot pressure to operate, and can be readily removed.

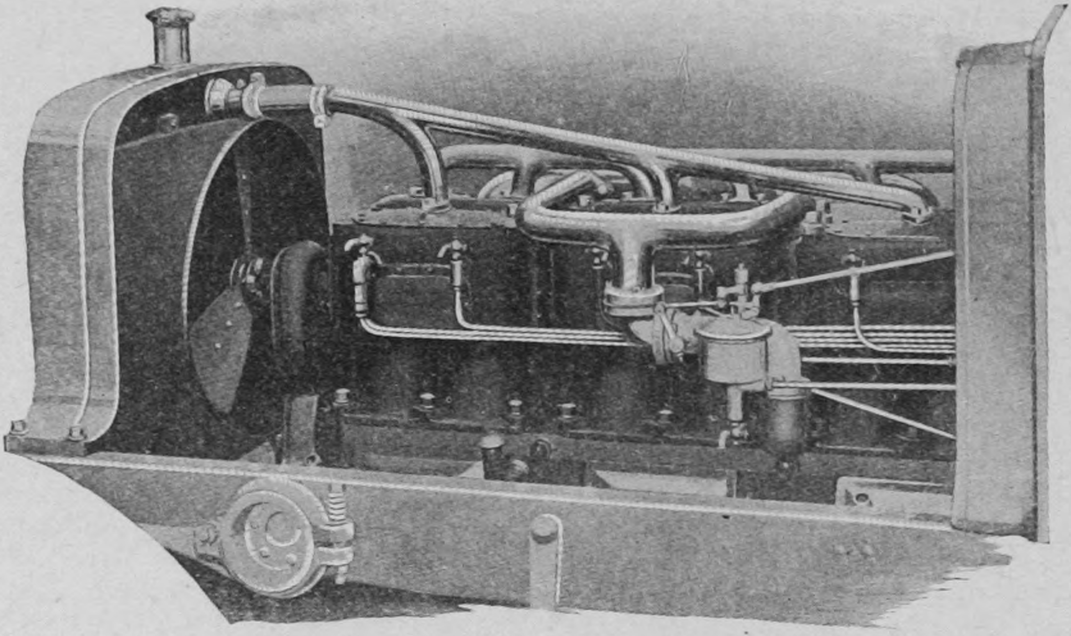


Fig. 5. Motor of the 1910 "Winton Six." Cylinders cast in pairs, with integral water jackets extending between cylinders. Cylinders 4½ in. bore by 5 in. stroke. A. L. A. M. rating 48.6. Attention is called to the complete housing of every moving part, except the fly-wheel and the neat arrangement of the wiring and small pipes. The aluminum crank case is divided into two lateral halves so that by removing one-half the crank shaft, pistons, and connecting rods can be taken out without disturbing the cylinders or accessories.

THE CHANGE SPEED MECHANISM.

As previously mentioned, the car has now four forward speeds and a reverse, with a direct drive on the third speed through an internal and external combination. The change speed mechanism is of the sliding gear type with selective operation, permitting any gear change without passing through any intermediate speeds. It is impossible to engage any new set of gears while the clutch is engaged; the lever being in neutral position. The shifting rods and levers, and the inter-locking mechanism are entirely enclosed in the transmission case, assuring freedom from dirt and preventing the dripping of oil. The clutch is contained in the same case and the whole assembly is placed close to the motor.

The side rails of the frame, which is of

clutch and transmission are carried o these drop frames, no sub-frame bein used.

The steering mechanism is of the scre and nut design, having ample bearin surface and liberally equipped with ba thrust bearings. The steering links ar adjustable and the steering knuckles ar mounted on roller bearings. The joints c the steering connections consist of heavy bolt with a bushing, secured by nut and large cotter pin. The steerin lever and steering gear are held in plac by a large taper pin. The steering whee rim is of hard rubber.

A NEW AXLE.

The front axle is an entirely new creation, being of channel section presse steel; claimed to be of great strength This is shown in one of the accompanying photographs. The ends are heavil reinforced by channel section drop forgings, the ends of which carry the steerin pivets. The rear axle is of the full floating type, no load on the driving shafts which simply transmit torque to th wheels. The weight of the car is carrie on the heavy drawn steel tubular housing which surrounds the axle. This construction permits of the removal from the ca of the axle shafts, differential, and it bearings, with the car standing on it own wheels. A spur gear differential using drop forged, nickel steel pinions, i

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which is enclosed in a grease tight metallic case, fitted with plugs for replenishing grease; these important members thus being surrounded by lubricant. With the car normally loaded, the driving shafts are practically horizontal. An improved flexible coupling, consisting of a split housing engaging the square end of the transmission shaft and a similar steel square bolted to the fly wheel, is interposed between the motor and transmission. The entire driving mechanism is completely housed. Needless to say, the car has no chains anywhere in its construction.

There are four brakes with solid spiders on the rear axle, two of these are internal and two external. The brakes are of large size, and in the 1910 models have been given increased leverage. Equalizers are employed, and it is claimed the brakes hold equally well in either direction.

SPRINGS.

The springs for 1910 are of the semi-elliptic type, without the scroll end formerly used. The same type is used at the front and rear, and permit a lower suspension of the body than in previous models. A special friction shock absorber is provided on each wheel, as are also rubber bumpers and jump straps. The springs are held to the axles by means of a clip, bolts from which pass through the axle bed. There are no holes through the spring leaves, thus minimizing the danger of spring breakage. A radius rod extends from each frame rail back of the centre of the car to the spring seat. These rods are pivoted and hold the rear axle in its position, at right angles to the frame; they also transmit the propulsive effort of the rear wheels to the frame. Extending from the rear axle to a cross member of the frame is a torsion rod, the forward end of which is allowed, by means of a link with ball joints at each end, a limited amount of movement.

Thirty-four inch wheels, twelve spokes each, made of well seasoned material, are fitted with four-inch front tires, and four and a half-inch rear tires. The regular equipment consists of Goodrich Quick Detachables.

A twenty-two gallon gasoline tank, of rectangular pattern and fitted with a gage, is placed at the rear. It contains, in a separate compartment three gallons, reserve supply, which is guaranty against being stranded for lack of fuel. The gasoline is forced under two pounds pressure, maintained by an automatic air pump, to a patented auxiliary gasoline tank placed on the dash, from which the fuel flows by gravity to the carburetor. This obviates the necessity of ever having to force gasoline direct from the main tank to the carburetor by a hand pump.

BODY.

The body of the "Winton Six" is, as usual, very large, roomy and well finished. It has good lines and a very stylish appearance. It is of wood construction throughout and highly finished. The body is noticably lower than Wintons of previous years. The tonneau is wide, very roomy, and fitted with doors of ample width. The upholstering is soft-edged and extra deep. The front floor is covered with stamped aluminum and a floor mat is used in the tonneau. Instead of using a foot rest, the tonneau floor is depressed just in front of the rear seat, so that the feet of the occupants rest in a natural position on this inclined surface; the position being very comfortable. Many other little conveniences have been arranged, among which may be mentioned a new tonneau door latch, which can be opened from the inside, doing away with the necessity of reaching over to the outside to unlatch the door.

The motor, radiator, tanks, ignition apparatus, etc., are so arranged that any type of special body which the purchaser may desire can be fitted. The dash is of mahogany and carries the auxiliaries previously mentioned. The bonnet is of aluminum, quadruple hinged and locked at the sides by means of spring plungers. The guards are of graceful and sweeping design, and fitted with shields, extending between them and the frame, and between the running boards and the frame. These boards are covered with stamped aluminum. A dust pan extends from the forward end of the motor to the rear of the transmission, and an apron extends from the radiator to the pan, thus fully housing the under-side of the car. There are drawer lockers under the front seat, and storage spaces under both seats.

The price remains unchanged at $3000 for the 48 horse-power Winton Six when equipped with either touring car, runabout or toy tonneau body. When equipped with limousine body the price is $4250, and with landaulet body $4500.

For the third successive season the Winton Company will manufacture sixes exclusively. In addition to the 48 horse-power car, there will be a 60 horse-power Winton Six at $4250.

The Indiana Motor Sales Company, Indianapolis, Ind., has purchased the output of the Indiana Motor and Manufacturing Company for the season of 1910. The name of the new car manufactured by the latter concern is the "Continental 35," and is a five-passenger touring type, which will retail at $1400.

STERLING £ TIRES

WHEN one of our tire makers puts a layer of fabric or rubber on a core, he has to stop till it is inspected—then he puts on another, and that's inspected. In addition, each tire maker gets a weekly premium for a perfect score—meaning "no seconds."

Sterling tires are cured on air-bags, giving internal as well as external pressure, and thoroughly amalgamating the different fabric plies and layers of rubber. That's why Sterling treads and carcasses don't separate—they stay "put."

Sterling Blue Tubes

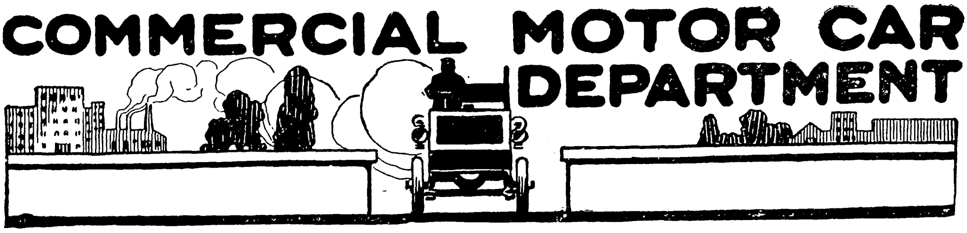
Our tubes are blue and in making them blue we make them better than any other tube. There may be other tires nearly as good as ours, but the Blue Tube is absolutely unequalled.

Rutherford Rubber Co., Rutherford, N. J.

New York, Broadway, at 53d St.
Baltimore, 300 W. Baltimore St.
Columbia, S. C., E. A. Jenkins Motor Co.
Albany, Ga., Clark's Garage
Troy, N. Y., 1934 Sixth Ave.
Rochester, S. B. Roby Co.
Toledo, O., 436 Summit St.
Cincinnati, 108 W. 3rd St.
Newark, O., Ball-Fintze Co.
Chicago, 1404 Michigan Ave.
Philadelphia, 680 North Broad St.
Richmond, Gordon Motor Co.
Savannah, 109 W. State St.
Jacksonville, McGraw Bros. & Vogt.
Syracuse, 248 W. Washington St.
Buffalo, 43 Niagara St.
Columbus, 15 E. Spring St.
Dayton, O., 4th & Jefferson Sts.
St. Louis, 3932 Olive St.
St. Paul, 16 W. Fourth St.
San Francisco, 50-56 Van Ness Ave.

STERLING BLUE TUBES

COMMERCIAL MOTOR CAR DEPARTMENT



WHY MOTOR TRUCKS DO NOT SELL AS RAPIDLY AS PLEASURE CARS

E. S. FOLJAMBE.

Even to the casual observer, it is noticeable that the number of trucks sold does not apparently keep pace with the increase in the sale of pleasure cars. How many manufacturers are there of commercial vehicles whose output is completely sold before the cars are on the road? Such conditions in the commercial vehicle end of the industry are almost unheard of, yet among pleasure car manufacturers this is the case in several instances.

There must be a reason for this difference in the sale of the two types of vehicle. Is it because the commercial vehicle has not yet shown itself to be successful, or is it because the salesmen connected with the commercial vehicles are not as capaable as those selling pleasure cars or are there other and more subtle reasons? Both of these causes are in reality to blame for the slow progress of the truck, as compared with the pleasure machine, but the writer believes that a combination of circumstances is more to blame for the present truck situation than the ability or inability of the salesman or the machine. It is not desired to convey the idea that the present motor truck is in any way defective or incapable of handling successfully the character of goods for which it was manufactured. Improvement in truck mechanism, such as greater refinement in the engines, transmissions, bearings and springs, has kept pace with these same improvements in the pleasure car, but the two machines cannot be readily compared from the users' standpoint, although they can from a mechanical standpoint; one is for pleasure, the other for business, in one case the cost is not always the item of importance, while in the other the cost is of paramount importance. The purchaser of a high priced pleasure car is bound to have his pleasure gratified and will willingly spend amounts apparently disproportionate to what is received in return, yet this same man would not enter into the purchase of anything connected with his business which it could not be shown would produce a profitable investment, from a dollars and cents standpoint. The pleasure vehicle is not in any sense a business investment, so in general the cost does not count as it does in a business proposition.

From the foregoing it might be assumed that the motor truck is not a commercial success; this, however, is not the case, for in many places it has demonstrated beyond all doubt that it is far more serviceable and effective than any horse-drawn vehicle could possibly be. The trouble seems to rest with the fact that while this is so in many cases, in others where conditions are different and where some slight carelessness or indifference may be shown by employees, the truck may become far more expensive than the horse A slight mistake on the part of an inexperienced operator, or continued carelessness by an employee, can easly throw the matter of cost on to the wrong side of the balance; and although the same is true to a certain extent when using horse-drawn vehicles, it cannot affect the cost so seriously In most cases the saving effected by the use of motor vehicles over that of a horse service is not nearly as large as the over-anxious salesman would have the purchaser believe, and this saving can easily be entirely annulled, unless vigilant care is exercised and the machines placed under the supervision of an experienced person

Of course, the matter of cost as here mentioned does not take into consideration the numerous advantages which the truck offers, which are not enjoyed by the use of horse-drawn vehicles. Among these may be mentioned, added range of territory, rapidity of delivery, increased satisfaction of customers, and the advertising effect of a high-class motor vehicle which is still a feature of importance. These should all be taken into consideration. but are of such a nature that it is very difficult to rate them in dollars and cents, and they are therefore either ignored or, if considered at all, introduce an element of uncertainty into the true cost of operation, and this feature of uncertainty is probably one of the most serious drawbacks connected with the sale of motor trucks. The business man, of all people, wants to know beforehand exactly what it is going to cost to accomplish certain results, and is able to figure to a nicety this cost when using horses. With the truck, the matter is entirely different and the item of which he desires most to be assured, is the one that it is almost impossible to figure definitely.

UNRELIABLE DATA.

To add to the difficulty very few authentic costs of operation are at hand and the figures presented by the truck maker, or the agent, often represent unusually favorable conditions or leave out innumerable small items which materially affect the total. In many cases the figures are compiled from a totally different class of work and are, therefore, not applicable to the case in hand, and only prove misleading. The worst of this is that they are usually so misleading that after a year or a year and a half of use of the commercial vehicle, the purchaser expecting to have his costs run about the same as those submitted to him, is disgusted to find that the actual figures run very much higher Too much care cannot be exercised by the agent when presenting satistics, and conditions should be paralleled just as far as possible, and liberal rather than under-estimates be given.

That it is possible to effect a considerable saving and increase business by the use of motor trucks has been repeatedly demonstrated, but it does not follow that every company can do this under all circumstances. So many inexperienced firms have adopted a motor service, handled in an incompetent manner with disastrous results as far as the cost of maintenance is concerned, that the business man is rather shy about launching on an experiment which he feels might prove an expensive one.

LIGHTER VEHICLES MOST SUCCESSFUL.

If we consider among commercial vehicles the various classes, such as the tractor with its trailers, the heavy truck, the light weight commercial delivery wagon, the taxicab, and sight-seeing cars, up to the doctor's vehicle, we find almost invariably that the quantity of the sales and the success attendant upon the use of the machines increases as we approach the strictly pleasure type of vehicle. Thus we find that the doctors generally recognize the increased advantages of the use of the motor car. In this service the inherent quality, speed, makes the machine immediately much more valuable than a horse. The extended range of territory covered in a given period of time is also extremely valuable and, when in combination with these advantages, a comparatively light weight machine is all that is required; the cost of upkeep can be kept even below that of several horses, which would be required to do the same work. The doctor is less fatigued and in better condition to render valuable service.

Probably one of the most important reasons for the greater success of the lighter weight machines, and those approaching pleasure types, is due to the character of the drivers employed. For these higher class services, where extremely heavy manual labor of loading and unloading is not required, higher class drivers can be employed with consequent better attention to the machine and more painstaking operation. On the heavier trucks the cost of operation depends largely upon the abuse to which the machine is subjected by the driver, and as yet the driver is an uncertain quantity. There is no particular or reliable source from which good men can be obtained, and the type of man accustomed to driving and handling heavy loads is not as a rule mechanically inclined, or in any way suitable to entrust with the care of a comparatively delicate piece of mechanism. To make matters more difficult, the wages which can be paid must be very nearly as low as those given the drivers of horse vehicles, and these are not usually high enough to attract and hold men of greater capabilities. The importance of having a high class man is not generally recognized by the uninitiated truck user, who usually tries to convert, in the space of a week or ten days at the most, his horse driver into a chauffeur. It is needless to say that this is a very unsafe practice and is another of the causes which contribute to the retarding effect noticed in the sale of commercial vehicles.

In summation, let it be said, that although motor trucks are gradually occupying the position of importance in the commercial world that is undoubtedly their due, they are not coming into general use with anything like the rapidity that has been shown by their sister pleasure cars. Briefly, the reasons for this are, not that the machines do not run, or that they are incapable, but are brought about by a series of circumstances which it is very difficult for a person who has not had actual experience with the machines to understand. These conditions may be; a machine unsuited for the special work that it is endeavored to have it carry out, a machine placed in a territory where its gear is entirely unsuitable, unusually severe road conditions, or machines not adapted to them, carelessness and inexperience of operators, lack of suitable overhauling, and machines overworked simply because they are machines and not alive. Very few seem to realize that any piece of mechanism has just as definite a length of life, and that this is just as surely shortened by continuous overwork as would be the life of a horse or other animal.

These various circumstances, with innumerable variations, are sufficient to make the difference between success and failure, and when added to the inherent dread of the average business man of upsetting the routine already established, or told, are sufficient reasons for the apparent slowness with which commercial vehicles are being adopted. This slowness is, in reality, more apparent than is sometimes realized as the progress of the truck is being compared to that of pleasure cars, the advance of which into public favor has been nothing less than phenomenal. Taking all things into consideration, the truck not as spectacular as that of the pleasur machine, is very substantial and of suc a nature that all the ground gained is pe manently held. The writer has her enumerated in as impartial a manner a possible the circumstances which are preventing a more rapid introduction of commercial cars, but firmly believes in th eventual supremacy, and almost universa use of motor driven commercial vehicles

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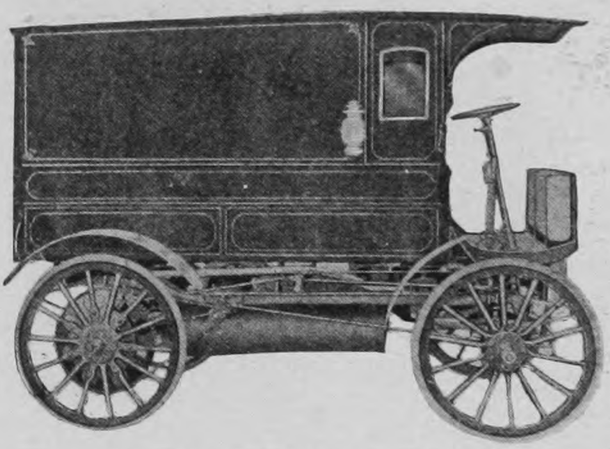
The Brodesser Light Delivery Wagon

P. H. Brodesser & Company, of Milwaukee, Wis., are offering two types of chassis, plan view of which is given herewith. They are sold separate or fitted with one of a number of different styles and types of bodies, one of which is shown. The two chassis are similar in arrangement, size and style of power plant. One model has a capacity of 1,200 pounds and has a 18-20 H. P. motor, and the other has a 24-26 H. P. motor and a capacity of 2,000 pounds.



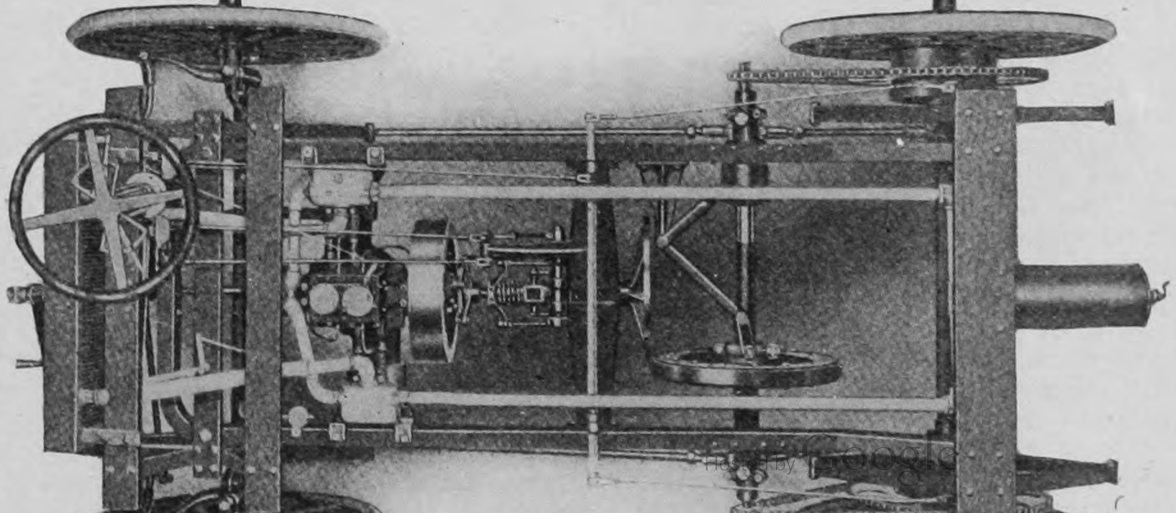
The Brodesser light motor wagon.

The power plant of the light car consists of a two-cylinder horizontal opposed motor rated at 18-20 H. P. It is wate cooled from a large radiator in front. Th valves are all on top and are all actuate from one-half time shaft.

The larger car has a four-cylinder opposed 24-26 H. P. horizontal motor of th same type. Ignition is by jump spark fron a Remy magneto.

On both cars the wheel base is the same 88 inches. The wheels are 40 inches i front and 42 inches in the rear and ar equipped with two-inch side wire tires The frame is made of 3x2x¼ inch angl iron, upswept at the rear, and is mounte upon full elliptic springs both front an rear.

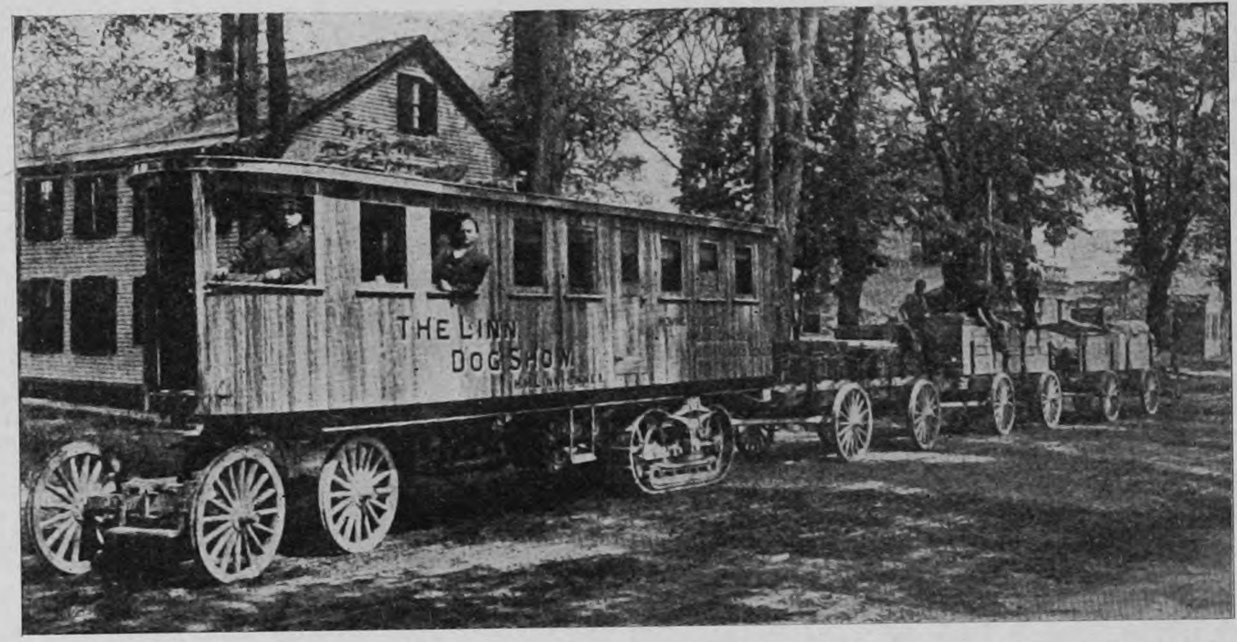
As may be seen in the illustration of th chassis, the power plant is situated forward under the seat and is hung by fou bracket arms, no sub-frame being used Two separate pipes carry the exhaus gases back over the jack shaft to the muffler which is in the center of the rear Directly back of the fly wheel is the helical spring which keeps the two discs o the friction change speed gear in engagement. A truss bearing supports the rea end of the engine shaft. To the rear, an



aft, is feather-keyed, and carries the iven wheel. This is fibre rimmed and ides on the counter shaft across the hole face of the driving wheel. The slid- g motion of the driven wheel is produced means of suitable levers, controlled by e driver, and gives any position in rela- on to the center of the driving wheel and onsequently any speed from zero to maxi- um may be obtained in either the for- ard or reverse direction. As an auxili- ry, there is an extra pedal, which, when perated, exerts additional pressure on the wo wheels for use when ascending steep rades or starting under heavy load. On wheels by means of chains. Distance rods run from the counter shaft outside the frame to both the front and rear axle. An apron protects the friction drive gear from mud and water.

The speed of the Brodesser car ranges from 3 to about 14 miles per hour. The gasoline tank has a capacity of 12 gallons and the fuel consumption gives about 12 miles to the gallon.

The builders of this car supply a large variety of bodies for their car, but if so desired, the chassis may be purchased alone.



The above cut illustrates the car used by the H. H. Linn Traveling Dog Show Co., of Maine. This car weighs complete about 20,000 pounds, and is powered by a 4-cylinder, 5½ x 6, 50 horse-power gasoline engine, manufactured by the Brennan Motor Mfg. Co., of Syracuse, N. Y. The car is divided into two parts, the living quarters and the operating room. In the latter are repair kits, dynamos and all that is necessary for the mechanical part of the business. A dynamo capable of furnishing power for 150 16-candle-power lights supplies the illumination for the car and also for the interior of the tent. The car is 26 feet long and 6½ feet wide.

WHAT IT COSTS TO TOUR EUROPE IN AN AUTOMOBILE.

The following statement of running cost, kept very accurately, gives a fair idea of what an owner has to spend to take his family abroad on a 6700 mile trip. The car used was a Locomobile "Forty."

The first column of figures given herewith indicates the expenses incurred while touring in England, 30 running days, 2000 miles; while the second column gives the cost of touring in France and Algeria, 47 running days, 4700 miles:

Cost per mile run:—		
Gasoline	$ .0310	$ .0496
Oil	.0092	.0063
Repairs and spare parts ..	.0069	.0065
[illegible]	.0045	.0039
Chauffeur's board and expenses	.0446	.029
	$ .2000	$ .187
Freight, England to France and France to Algiers and back	....	.038
Total cost per mile	$ .2000	$ .225

Number of gallons of gasoline used, 215 miles per gallon on gasoline used, 9.3.

Hotel expenses, leaving out of accoun Paris and Nice, where any price may b paid, averaged throughout France and A geria, $4.00 per day each. This include wine, tips and all expenses and in ever case, room containing two beds, which ar more expensive. Motorists are alway piled by Burns Brothers, coal dealers, of New York City. The truck used by this concern is a Hewitt ten ton load capacity, manufactured by the Hewitt Motor Company, 6-8-10 E. 31st Street, New York City. The truck has been in constant use for four months, and no delays have been experienced, nor have any loads been missed. It is said that the car is in excellent condition, and that the tires are calculated to go eight months and probably more.

The following specifications are daily averages calculated on 13 working days from October 13 to 27 inclusive:

Average miles per day	35.4
Aver. gallons gasoline per day	11.9
Average miles per gallon	2.97
Aver. number of loads per day	8.3
Average tons per day	84.03
Total tons in 13 days	1092.39
Total pounds in 13 days	2,184,640.00
Cost per day (maximum)	$16.00
Cost per ton	.19
Average miles, radius	2.13
Weight of car, empty	13,000 lbs.
Average weight of load	20,250 "
Total weight	33,250 "
Average Rolling Load	23,125 "
Aver. ten miles per gal. of gasoline	34.43

So far the car does not show any abnormal wear and there have been no breakages or serious deterioration of parts. The car is able to deliver about 4,000,000 pounds per month, or 50,000,000 pounds per year, and that at about half the cost of delivering with horses.

A Baker electric express wagon has been put into service at the White House at Washington, D. C. It will be used for carrying the mails and for conveying baggage to and from the station.

Herewith we show a photograph of the new model F Chase Runabout used by J. G. Hardenbergh, a traveling salesman for the Dunn-Salmon Co., shoe manufacturers of Syracuse, N. Y. A practical demonstration satisfied the shoe concern that the machine would soon pay for itself out of the saving on excess baggage and drayage in transporting trunks, at the same time making

N. J.

The Bruna Taxicab Company, operating taxicabs in both Montreal and Toronto, Canada, has now placed twenty cabs in service in Winnipeg, Man.

The fire chief of Charleston, S. C., is endeavoring to get an appropriation for the purchase of a motor hose and chemical wagon.

A motor hose and chemical wagon is to be purchased by the volunteer firemen of Cold Spring Harbor, L. I.

An automobile ambulance was recently put into service in Dallas, Texas, by the Gallaway Taxicab Company under contract with the municipality.

Jacksonville, Fla., now has a taxicab service of 15 cabs, which number will soon be increased to 35.

The Suburban Motor Transit Company was recently incorporated at $100,000 to operate taxicabs in Jersey City, N. J.

A $3,000 automobile hose and chemical wagon is to be purchased by the authorities of Nahant, Mass.

The Palace Boarding and Livery Stable, Peoria, Ill., has entered the taxicab business and has ordered several of the Sultan Motor Company's cabs.

The Taxi Company was recently incorporated at San Francisco with a capital of $100,000. The new concern is doing a general garage business besides operating a passenger and freight transportation service.

The Suburban Motor Transit Company was recently incorporated with a capital of $100,000 to operate a line of autos between Perth, and South Amboy, Rahway and Elizabeth, all in the State of New Jersey.

Another advocate of the replacement of horse-drawn equipment by automobiles, is the chief of the fire department of Montgomery, Ala.

Three motor cabs have been placed in service in Utica, N. Y.

The city of Ventura, Cal., recently purchased a $7,500 automobile fire engine. It has a pump capable of throwing three streams, chemical apparatus, ladders and axes. The hose is carried in the body of the auto, and the members of the local fire company can all ride on the footboard.

The Johnson Auto Company, of Vicennes, Ind., recently instituted a taxicab service, which it is operating from its garage on South Second street. The rates are the same as for horse-drawn cabs.

Fifty-five hundred dollars has been appropriated by the commissioners of Washington, D. C., for the purchase of an auto fire engine.

Wilmington, Del., is considering the purchase of one or two auto hose and chemical wagons.

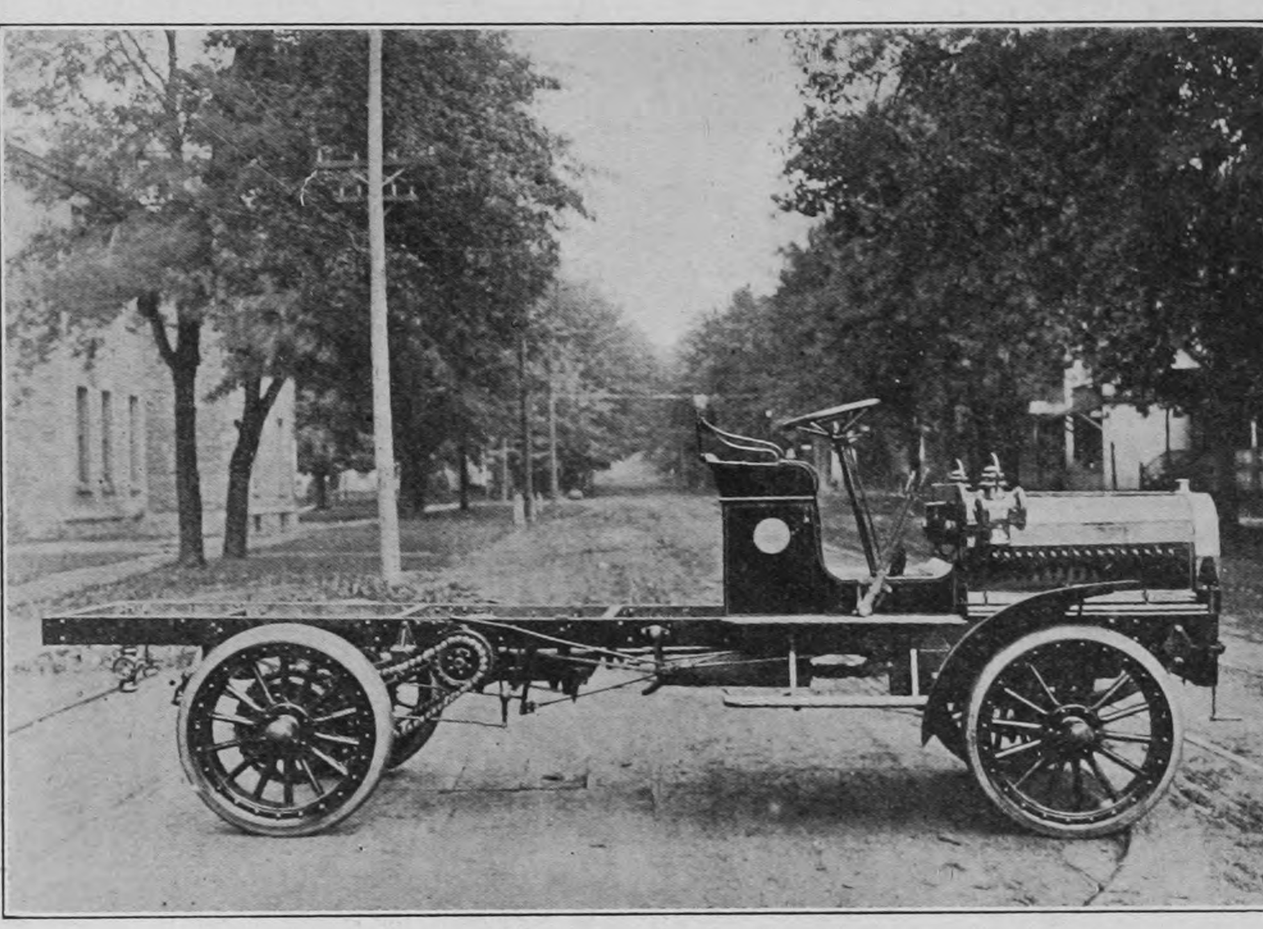
Geo. H. Prouty, of Barre, Mass., has recently had delivered from the Grout Auto Co. a nine-passenger automobile to run between Petersham and Barre, Mass., carrying passengers and mail. This automobile is made upon somewhat different lines than the regular automobile bus used for such work, inasmuch as it is finished with the elegance of an automobile, has seating capacity for three people on each seat, and a speed of thirty miles per hour. Heretofore this trip has been made with horses. So well pleased is Mr. Prouty with the

AMERICAN

(Worthy of the name)

Trucks and Passenger Cars

"AME CKS" DELIVER THE GOODS.



MODEL M, 1½ to 2 Ton Chassis

We Manufacture **Three (3) Standard Chassi**

3 { Model "O," Capacity 5 Tons
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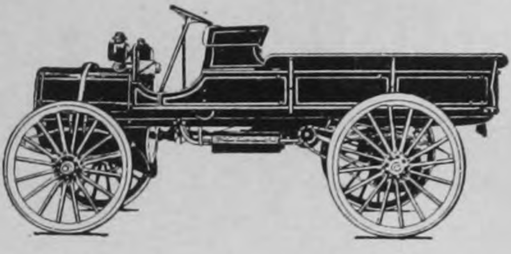
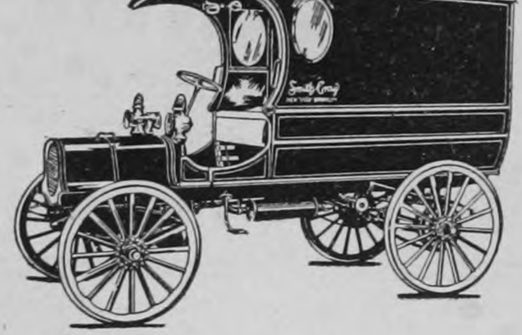
Write us for Catalog with specifications and our attractive **AGENCY PROPOSITION.** It will pay you. **AMERICAN** Trucks sell and they stay sol
We will tell you the reason why if you want to know.

American Motor Truck Co.

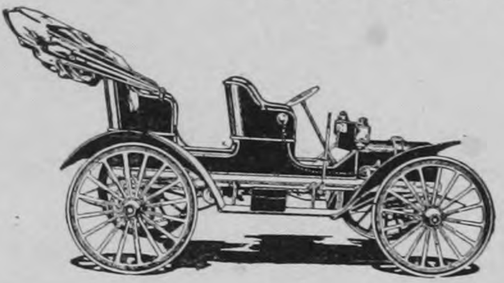




The Chase Motor Wagon

with its **wonderfully simple, air cooled, valveless** motor, high wheels, solid tires and enclosed planetary transmission is the most practical business wagon on the market—because it is dependable for every day service—is economical to maintain and simple to handle.

Prices, $750, $900, $1050



Our 1910 line includes the best high wheel Surrey ever built.

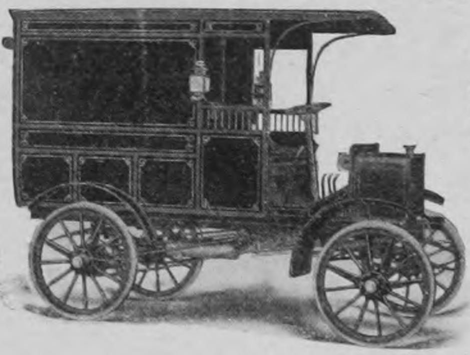
Proofs and Catalogue Mailed on Request

CHASE MOTOR TRUCK CO.
Syracuse, N. Y., U. S. A.

Hart-Kraft Business Wagons

The most reliable and economical delivery wagon offered for 1910

Actual Experience is Proof of Our Claim



Read the following condensed report of a Hart-Kraft Wagon which was operated from 22nd St., New York City, to Mt. Vernon, Pelham, New Rochelle and return DAILY. The wagon contained two men and the number of packages indicated by the deliveries. Gasoline figured at 15 cents per gallon; oil at 40 cents.

Total miles	71 days, 4014½	Total average one day,	56.5 miles
" deliveries	" 3175	" " " "	46 deliveries
" gasoline used	" 317½ gals.	" " " "	4½ gallons
" oil used	" 124 pts.	" " " "	1½ pints
" fuel cost	" $53.83	" " " "	$0.76

Fuel Per Mile for Whole Period:

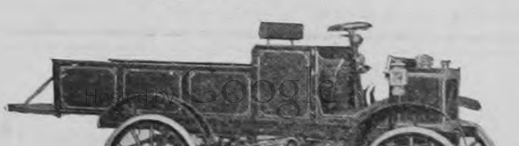
12½ miles per gallon of gasoline **37½ miles per pint of oil**

The Hart-Kraft Wagon

Has Unit Power Plant, Magneto Ignition, Timken Bearings, Planetary Gearing, Multiple Disc Clutch, Double Opposed Motor, Water Cooled, Full Elliptic Springs, Double Chain Drive, Solid Tires.

All parts of the Power Plant are easily accessible from the Driver's Seat.

Special Bodies of Selected Design made to suit Customers.



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Brake Drums, Wheel Flanges, Hub Caps, Ball Cups and Retainers, Hood Supports, Step Hangers, Brake Bands, Gear Covers, Universal Joint Covers, Clutch Discs.

These are only a few of the principal parts we make for automobiles.

The Crosby Company, Buffalo, N. Y.

CRAMP

50,000 MILES WITHOUT ADJUSTMENT.
THESE PARSONS WHITE BRASS BEARINGS RAN THAT DISTANCE IN A PACKARD CAR. THEY ARE BACK IN THE CAR WITHOUT EVEN BEING SCRAPED
STILL RUNNING RUNNING STILL.

THE WM CRAMP & SONS SHIP & ENGINE BUILDING CO
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THE
STRENUOUS
RANDOLPH

A live proposition from every point o view. Built in capacities ranging from 150 lbs. to 5 tons.

Applica ions for Agencies in unassigned territory considered

RANDOLPH MOTOR CAR CO
175 E. RANDOLPH ST., CHICAGO, U. S. A.

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The **"World's Best"** Commercial Cars. In power

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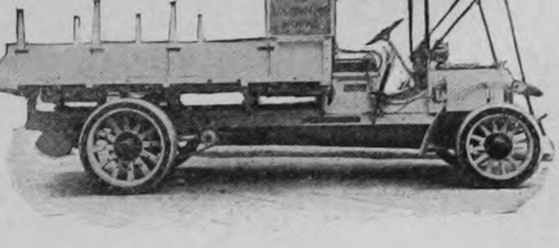
LIGHT DELIVERY



Commercial Motor Vehicles of every size and type, both Gasoline and Electric.

Specially built machines when required for unusual conditions of service.

Garage equipment for the proper care and maintenance of Motor Trucks.

The Commercial Motorcar Co.
Times Building, New York

Be the First in your Field

We want to get in touch with you automobile dealers who realize the great undeveloped field for the commercial car.

If you're an experienced automobile man, you're probably a little skeptical—you wouldn't handle a commercial car unless you were sure it was right in every particular.

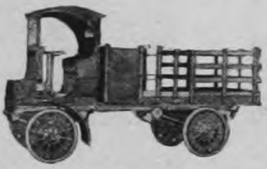
You Want the Grabowsky

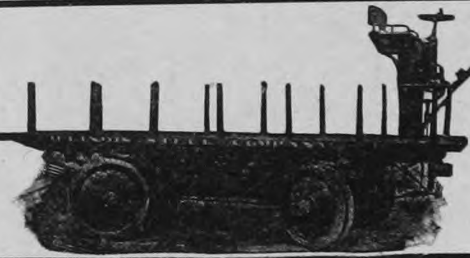
because you can demonstrate its superiority, its economy, and its dependability—to the business man in plain terms that he can't get away from.

And after you have sold it, you can go back to him, and receive praise for the car instead of "knocks."

The story is too long to be printed here. Write us and we will explain in detail. Better speak now for unassigned territory, and look us up at the New York Show. A letter now will be better than one too late.

Grabowsky Power Wagon Co.
80 Champlain Street :: Detroit, Mich.
Standard Mfrs. A M C A.





4-Wheel Drive Gas-Electric

(Something New)

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COUPLE-GEAR FREIGHT-WHEEL CO.
560 BUCHANAN ST., GRAND RAPIDS, MICH.

CRAMP

Parsons' Manganese Bronze Axles

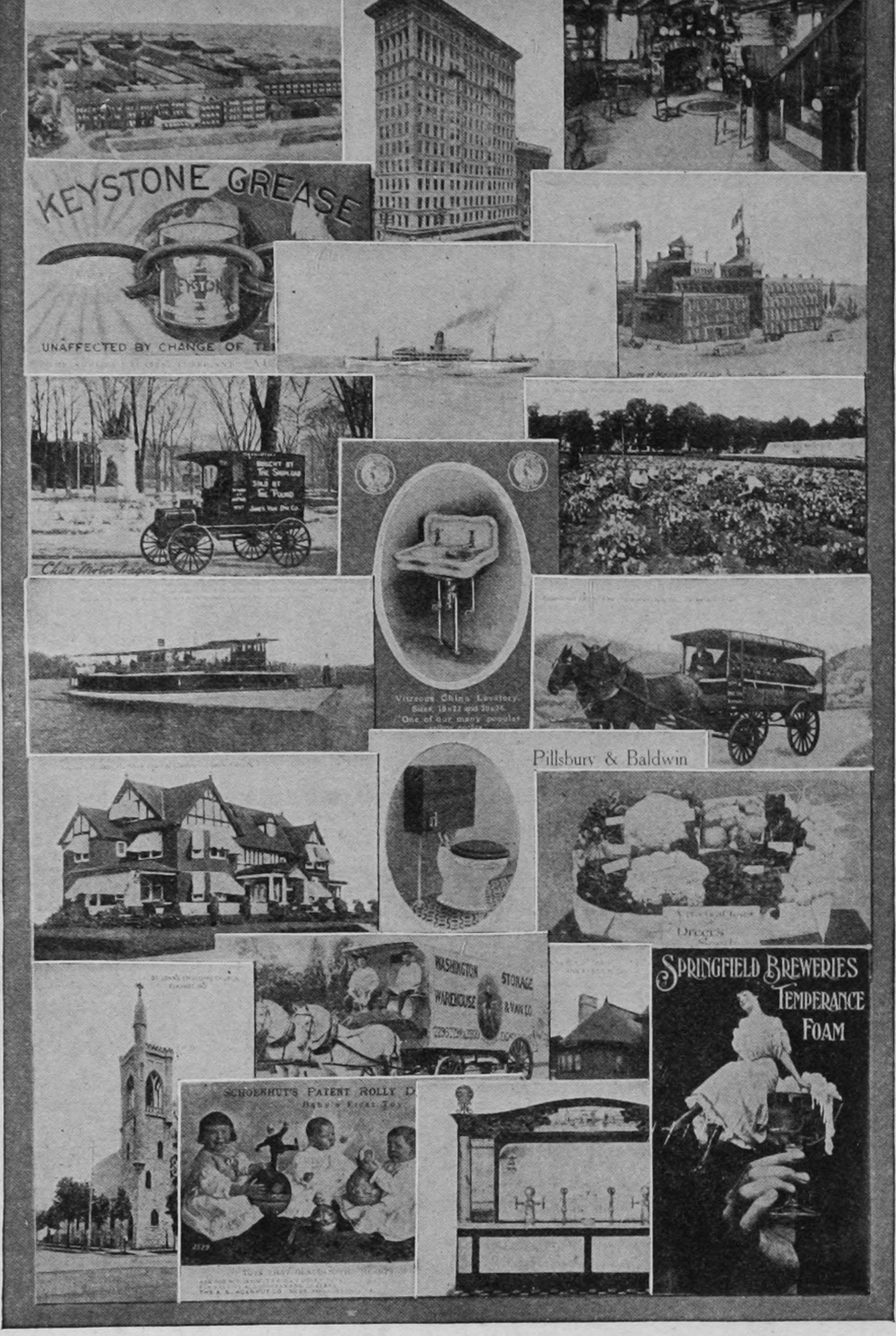
Stronger than steel.
Thousands in use.
None have ever broken.

The Wm. Cramp & Sons Ship and Engine Building Company
Philadelphia, Pa.

Rapid

Commercial Power Wagons

offer greater money-making possibilities to the live agent or business man, with financial backing, than any other line. Rapid Commercial Power Wagons are built in sizes from ½ to 6 tons capacity, for any line of business. Every user of one or more horses represents a prospective buyer. See the possibilities now? Write today for catalog and agent's prospectus.


KEYSTONE GREASE
UNAFFECTED BY CHANGE OF TE
KEYSTONE
BOUGHT BY THE SHOWLOAD SOLD BY THE POUND
Chase Motor Wagon
Vitreous China Lavatory.
Sizes, 18x22 and 20x24.
"One of our many popular
Pillsbury & Baldwin
Dreer's
WASHINGTON STORAGE WAREHOUSE & VAN CO.
SPRINGFIELD BREWERIES
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Baby's First Toy

The above half-tone represents 20 different ideas in

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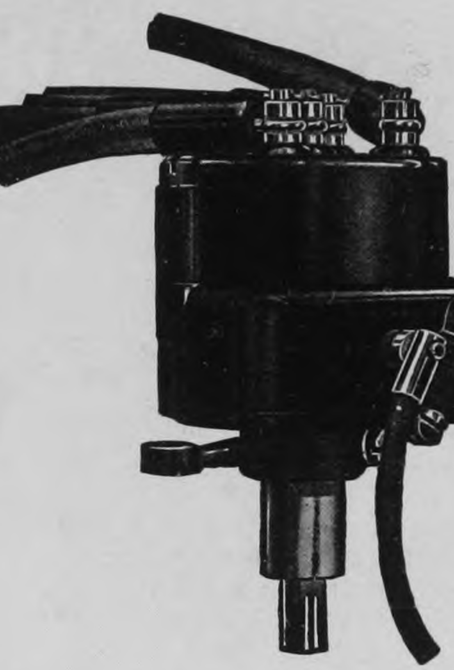
The Heart of an Ignition System



lies in its mechanism for making and breaking the primary current. This should be simple in the extreme, with no heavy moving parts, since these mean increased wear and shortened life of the apparatus. It must make contact for a length of time which shall be independent of the engine speed, but which may be shortened or lengthened within limits, by a manual adjustment.

The Atwater Kent
Unisparker or Spark Generator

as a contact maker which embodies to the highest degree all of these equirements. It may be adjusted by means of a single, conveniently laced contact screw to the point where sufficient spark is built up to gnite the mixture without any nissing, and the entire system hen needs no attention for fifteen undred more miles. A self-tarting switch obviates the ecessity for cranking, which vith its other advantages makes t the logical system for the wner who desires a minimum f trouble and expense.

ATWATER KENT SWITCH
PATENT APPLIED FOR
ON OFF

With the SPARK GENERATOR or UNISPARKER the storage attery, with its high initial expense and recharging nuisance, is unnecssary. Six dry cells provide excellent ignition from 2000 to 3000 miles.

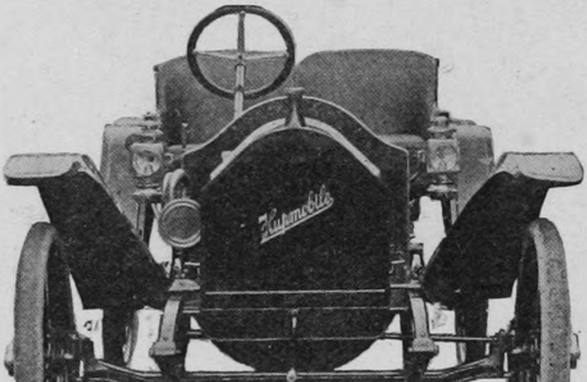
Send for our catalogue; the first help in ignition troubles.

HUPMOBILE
FOR 1910

March 1st, 1909, the Hupp Motor Car Company, of Detroit, started delivering a light 2-passenger runabout, and by the middle of August had completed the construction and shipment of its season's output of five hundred cars. Long before the finish of the 1909 season they had several experimental cars of the 1910 model on the road, giving them exhaustive tests under the most trying conditions, and by the time the final cars of the 1909 season were nearing completion the 1910 model had been thoroughly tried out, received the O. K. of Mr. Nelson, the chief engineer, and the construction of them was well under way.

This company is now occupying its new factory, which is of the most up-to-date construction of concrete and glass with nearly 50,000 square feet of floor space and embracing all the latest features of the modern automobile factory for the production of cars in quantity without sacrificing high standard of workmanship.

The cars of the new model, which is known as Model "B", are being turned out at the rate of thirty a day in an effort to supply the phenomenal demand for this handsome little car, and it is the intention of the manufacturers of the Hupmobile to build no less than seventy-five hund
cars for the 1910 season.



This attractive runabout, while of or
nal design throughout, follows what is
ceded to be the most approved practic
motor car construction. No radical char
have been made in the new model. It
tains the same racy lines that have m
this little car famous. Continuing t
policy of last season, the company will
fine their efforts to the construction of
model only, the mechanical features
which, and the changes and improveme
over the 1909 car, are given in the acc
panying description.

GENERAL CONSTRUCTION.

The wheel base is 86 in. with a stand
tread and 30x3 in. G & J tires are u
While the car, as shown in the headpi
sets very low the road clearance is am
being 11 in. under the axles and 13 in.
der the fly wheel. The standard colo
"Hupmobile Red" with black moldings
hair stripes. The upholstering is p
black machine buffed leather, padded
support the lower back and still leave
shoulders free. The seats of the
model are somewhat wider than those
last year and the backs are slightly hig
which makes for greater comfort to
passengers. The cushions are 4½ in
the front and 3 in. at the rear. Plenty
foot room is allowed, as there is 28
from seat to dash. The 15-inch stee
wheel is finished in mahogany and
dash of the new model is of Circass
walnut. The hood is three-hinged, 30
long, clamped in place by four lever-h
down clamps journaled in metal bushi
in the side hood strips. A polished al
inum ledge supports the hood at the d

One of the features which will be

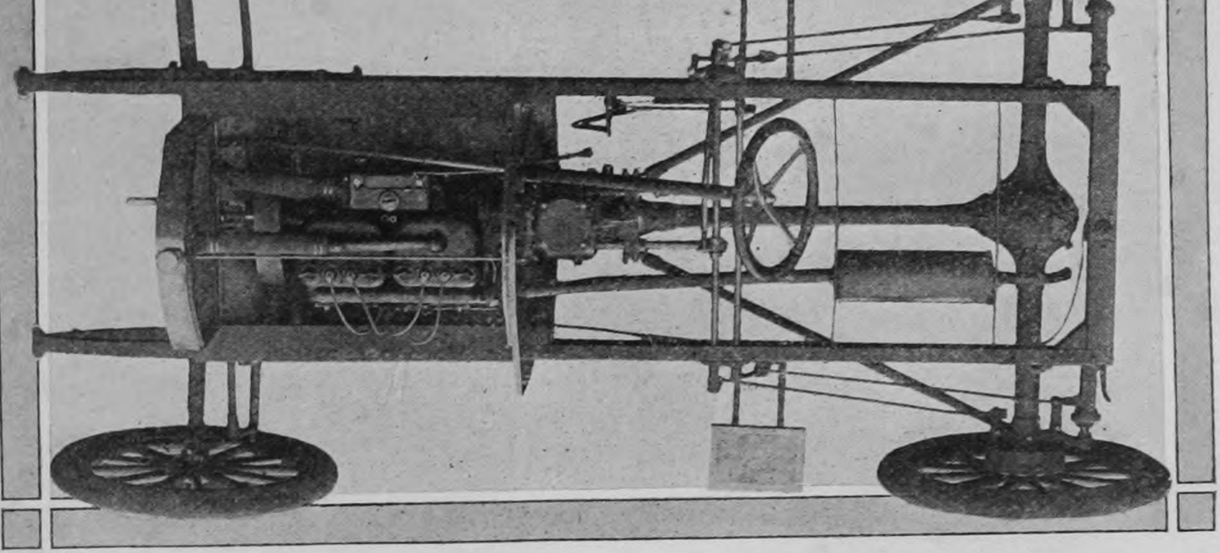


Fig. 2. Plan view of the Hupmobile for 1910. Wheel base 86 in., tires 30 by 3 in., motor four cylinders, 3¼ y 3⅜, 16-20 H. P., cylinders cast in pairs, valves all on one side, jump spark ignition by Bosch high tension nagneto, lubrication by splash and oiler, cooling by thermo-syphon system, multiple disc clutch, selective slid- ng gear transmission, two speeds forward and reverse, two sets of internal expanding brakes on rear wheel lrums, semi-elliptic springs in front and platform in rear.

his tank has a capacity of 11 gallons and carried at the rear of the seat at a suf- cient height to insure plenty of gasoline n all hills. The car complete weighs 1100 ounds, and is capable of a speed of 50

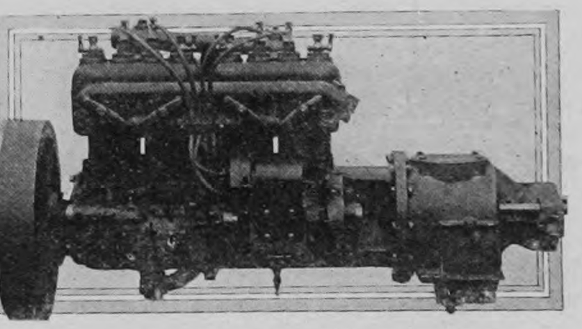


Fig. 3. View of the left side of the motor of the 1910 upmobile, showing the location of the magneto, car- retor and intake and exhaust manifolds.

iles per hour. The price remains the ame as last year, $750. This price in- udes oil lamps, tools and full equipment r the road.

THE POWER PLANT.

The 4-cylinder motor, shown in views 3 nd 4, has a 3¼ in. bore by 3⅜ in. stroke, nd is rated at 16-20 H. P. The crank shaft hich is of 30 point carbon steel is 1¼ in. iameter with a ⅜-in. offset from the cen- er of the cylinders. The forward end is apered to carry a 40-pound helical bladed, 4-in. fly wheel that is clamped on a aper by a 2-jaw hardened starting crank ut. The starting crank is journaled in a asting bolted to the front cross member f the frame and is held out of engage- ent by a helical spring. The drop forged onnecting rods are of "H" section and the

Parsons' bronze, hand scraped to a bearing, and the caps have oil scoops on their lower side. The bone-hardened and ground piston pins are a drive fit in rods locked by cone-pointed set screws and bear in the pistons. The pistons are 3⅝ in. long, taper ground, with an oil groove ⅞ in. wide for the lubrication of the piston pins. Three eccentric bevel split packing rings are used, made of special analysis, hard, close grain iron, ground on three faces. The valves are 1½ in. in diameter, 45 degrees seat with nickel steel heads electrically welded to carbon stems and ground all over. All valves are on the left side with spark plugs over the inlets. The priming cups are over the exhaust valves. Inlet and exhaust headers are of cast iron held with four clamps and packed with copper asbestos gaskets and centering rings. The inlet header has a chamber that extends from the lower air inlet of the Breeze carbu-

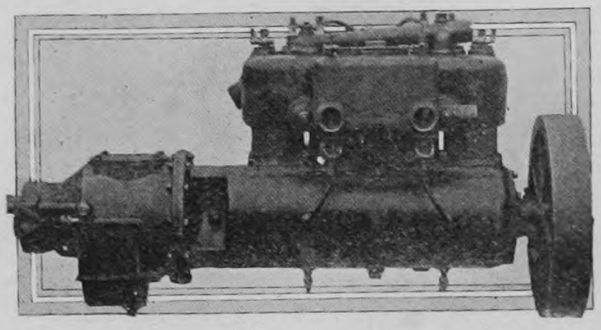


Fig. 4. Right side view of the Hupmobile motor assembly, showing the oiler with sight feeds and the water manifolds leading to and from the water jackets.

retor up to the exhaust header, preventing condensation and delivering warm air around the spray nozzle. A one-inch pipe

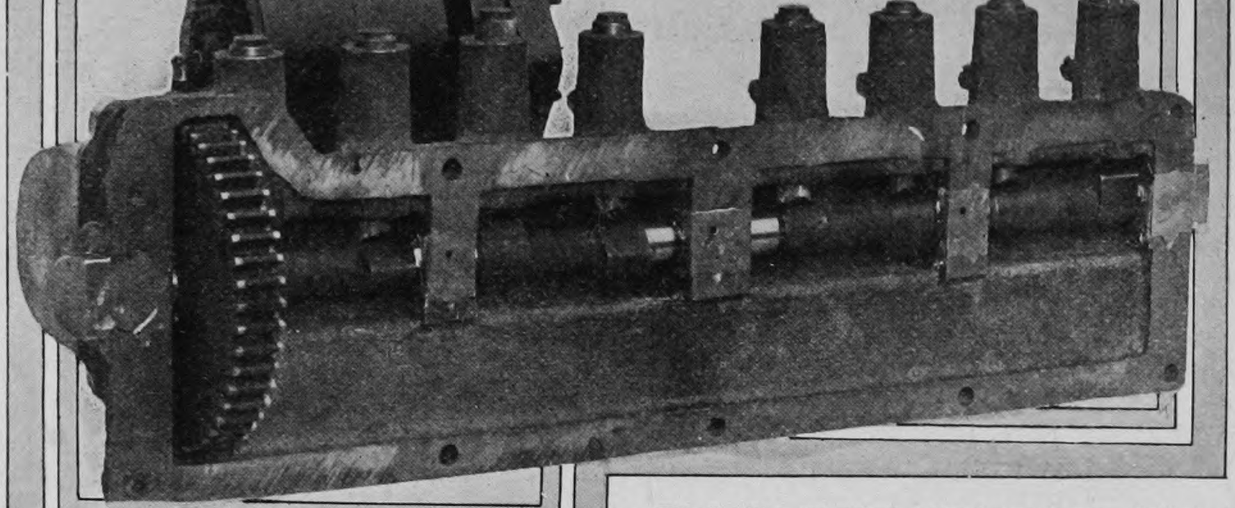


Fig. 5. The one piece dropped forged cam shaft in tl five bearing side plate, together with the magneto drive from the cam shaft, the cast iron side plate also hold the valve tappets.

CAM SHAFT AND CAMS.

A one-piece, drop forged, bone-hardened and ground cam-shaft is babbitted in place in a cast iron side plate shown in Fig. 5, which extends the full length of the motor, and when removed gives free access to the connecting rods. This shaft has five bearings open to the splash of oil in the crank case, and as the babbitting in place produces a perfect alignment of these bearings, they should wear indefinitely without shake. The valve tappets also have their bearings in this plate. They are ⅝ in. in diameter, bone-hardened and ground. The cam contact end is milled on a radius giving practically the same effect as a roller and eliminating all possibility of lost motion incidental to the construction where a roller is used. The tappets have gray fibre inserts where contact is made with the valve stems, insuring quiet valve movement. A bearing ring on the end of the valve stem insures ample bearing surface on the valve tappet, thereby practically eliminating all wear at this point. The cam-shaft gear is of gray non-swell fibre backed on the sides with steel, and meshing with a crank shaft and magneto gear of steel. The centres of the gears can be adjusted by varying the thickness of the gasket used and thus a quiet gear can always be obtained.

TIMING THE MOTOR.

In timing a new motor, the side cover is bolted in place, with the proper teeth in mesh, a clamp is then put on where the magneto gear meshes which holds the gear fixed in relation to the side cover; it is then unbolted and put in a timing jig on the bench and the cams ground with a small emery wheel to the correct opening all that is required is to correct the sligl variation incident to babbitting the sha in place. After this grinding operatic the side cover is put back on the moto and if necessary, the valve tappet fibr are filed to secure the required clearanc between the tappets and the valves. Th system has been found very rapid and a curate, as all slight errors in placing ke ways and the slight warping of the car shaft in hardening are eliminated.

THE IGNITION.

A Bosch high-tension magneto with fi ed ignition is mounted on a ledge on th side cover and driven by a housed ge keyed on the armature shaft and meshir with the fibre cam-shaft gear. Five wir lead from the magneto, one to each spar plug, and the remaining one to a swite on the dash where the current is short-ci cuited to cut out ignition. This switch the only operative device on the dash.

UNIQUE OILING SYSTEM.

The oiling system is by splash with lev drains. Oil pockets are provided over th Parsons' bronze engine and transmissic bearings with a return oil drain on th front fly-wheel bearing. The two cran case compartments provided with lev drain cocks are fed by an oiler cast i tegral with the inlet water header. Th oiler which is an improved type of th used on the previous model has two plu gers held to seats at their lower ends b springs. On the upper ends of these plung ers are mounted rollers which bear on a operating bar extending through elongate slots in the plungers. This bar is pos tively connected with the carburetor thro tle control mechanism by a ball and socke joint and is provided with graduated co

rank cases. Adjusting nuts on the tops
f these plungers permit of very accurate
etting of the amount of oil fed. This sys-
em of connecting the oiler with the throt-
e mechanism insures an absolutely posi-
ive feed in the amount required, i. e.,
rom an entire cessation of feed when the
hrottle is closed to a maximum feed when
he throttle is wide open. Either one of
he engine compartments may be flooded
y lifting these plungers off their seats,
bviating the necessity of pouring oil down
he vent tubes. Before entering the crank
ases the oil passes through sight feed
lasses.

RADIATING SYSTEM.

The thermo-syphon system of radiation
s employed, using about three gallons of
vater. The general construction of the
adiator is the same as used in 1909, but
he number of vertical tubes has been in-
reased from four to five and the inter-
nediate tank has been enlarged. These
hanges have greatly improved the effici-
ncy of the radiator and entirely eliminat-
d any tendency of the water to boil. A
igh filler tube showing a slightly belled
aper adds a pleasing finish to the radiator.
he outlet from the motor enters a tank
ight inches from the top of the radiator.
his tank extends across and half way
hrough and is not visible from the front.
he hot water entering this must pass up-
ards through the tubes four inches in
ength, which is sufficient to prevent
teaming. Two studs in the bottom of the
adiator fasten it to the front frame cross

FIXED SPARK.

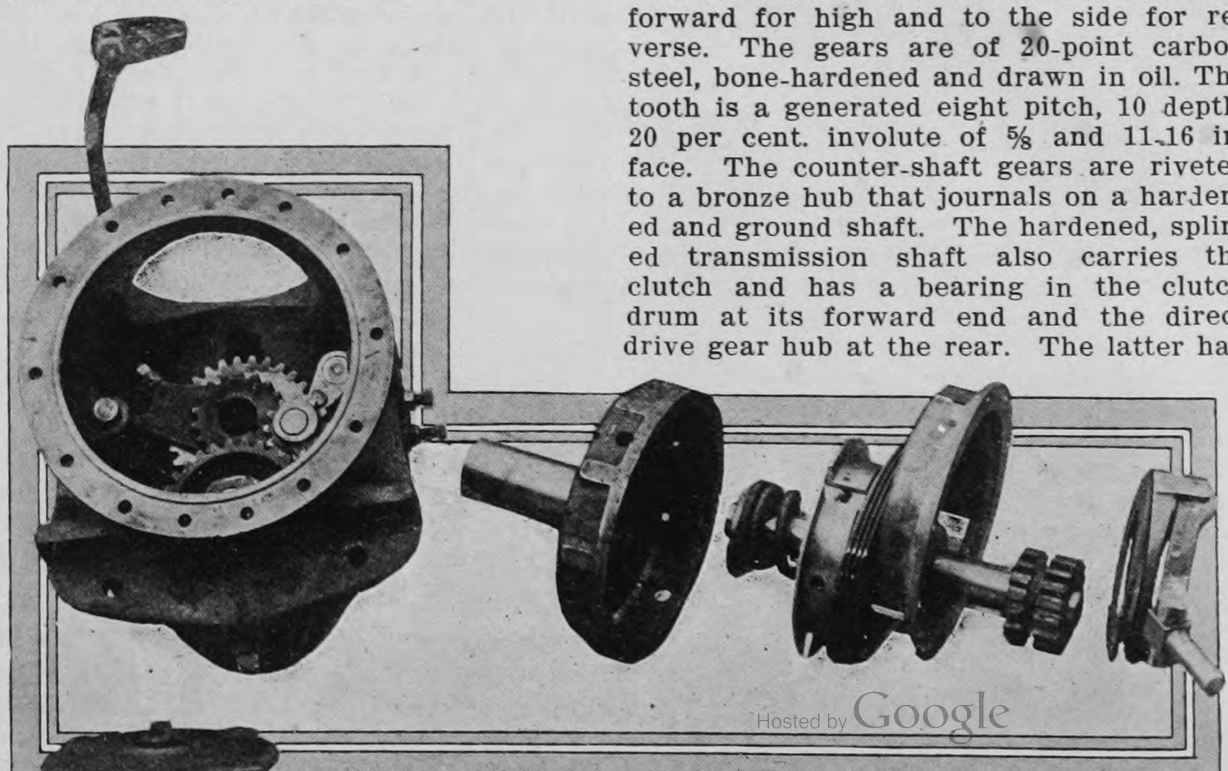
The carburetor is controlled by an accelerator pedal and can be set by a hand lever under the steering wheel. There is no spark control, as the magneto is set with a slight advance and generates a hotter spark at high engine speeds. This has been found satisfactory in France, where fixed magneto ignition is used on 44 per cent. of the cars, contributing more toward the life of an engine than fine workmanship and cuts out at one stroke the "bugaboo" of four-cylinder engine ignition.

CLUTCH AND CHANGE GEAR.

The most noticeable change in the mechanical construction of the 1910 Hupmobile is the adoption of a multiple disc clutch shown in Fig. 6. This clutch has nine plates of saw blade steel and is contained in the transmission case running in an oil bath. The transmission case of cast iron is bolted to the crank case and is of rigid construction. The clutch is thrown out of engagement by a pedal pivoted to this case.

The sliding gear transmission, also shown in Fig. 6, has a low-speed ratio 2.7 to 1, with a direct drive on high. The toggle operated reverse pinion has the same ratio as the low gear.

There is one neutral position of the side control from which any gear can be meshed. The movements are back for low, forward for high and to the side for reverse. The gears are of 20-point carbon steel, bone-hardened and drawn in oil. The tooth is a generated eight pitch, 10 depth, 20 per cent. involute of ⅝ and 11-16 in. face. The counter-shaft gears are riveted to a bronze hub that journals on a hardened and ground shaft. The hardened, splined transmission shaft also carries the clutch and has a bearing in the clutch drum at its forward end and the direct drive gear hub at the rear. The latter has



a long Parsons' bronze journal in the transmission case and is broached square to take the male end of the universal joint.

The rear end of the gear case has a large cylindrical bearing that fits over the spherical universal housing of the propellor shaft, making a dust-proof joint and taking the torsion of the rear axle. Two ball end radius rods extend from the rear brake supports diagonally up to sockets in the transmission case, making a very flexible construction.

REAR AXLE ASSEMBLY.

The rear axle is of great strength. The 2½ in. by 7-32-in. wall steel tubing is pressed and riveted in a well-ribbed bevel gear housing, no truss rod being used. The axle shafts are 1⅛ in. diameter, of cold drawn piston rod steel journaled on Hyatt bearings at the wheels and large shim adjustment two-point ball bearings at the differential case and propeller shaft.

The drive pinion and small bevel differential gears are of 3½ per cent. nickel steel, bone-hardened; the large gears meshing with these are of 30-point carbon steel, bone hardened.

The bevel drive gear and pinion are of 48 and 12 tooth respectively and the teeth are six pitch 20 per cent. generated. The 12 tooth pinion is electrically welded to the drive shaft, the rear end of which is supported on a "New Departure" ball bearing which takes both radical and thrust strains.

The front axle shows a change from the one formerly used. A drop forged 40 per cent. carbon steel, heat treated deep "I" beam section having an angle drop from the ends and the yokes forged integral is now used in place of the tubular built-up axle which was used on the model "A". The drop forged steering spindles are 1 3-16 in. diameter mounted with two point adjustable ball bearing.

BRAKES AND SPRINGS.

The four internal expanding cam actuated brakes are lined with Thermoid. Two are used side by side on each rear wheel and are interchangeable. A pedal operates one set and a hand lever the other.

The inverted double sweep rear cross spring has a ball socket clipped in the middle, taking a ball-ended taper shank bolt that seats in a bracket in the middle of the rear cross frame channel member, giving the frame a three-point suspension.

The eyes of the spring are pivoted to sliding journals having a bearing on a cross bar parallel with the axle and supported by arms extending rearward from brake supports. Behind each journal is a compression spring that exerts a pressure outward, tending to deflect the cross spring and accelerate its deflection but retard the rebound. The front springs are semi-elliptic, 34 inches long, hung with compression shackles at the rear.

The fact that the frame is mounted on a ball allows of a certain gravity swing that is, of course, no faster than can be followed by passengers in the car, so there is seldom a rebound of enough magnitude to lift the weight of a passenger from the cushion.

STEERING GEAR.

The enclosed stearing gear is the rack and pinion design. Both gears are bone hardened. Contrary to most designs of this type, there is no bending movement in the rack as it has a straight line connection with the axle steering arm by means of a drag link with heavy adjustable ball sockets at both ends, one of which encloses a helical recoil spring which absorbs all ordinary road shocks. With this construction no movement of the steering wheel is perceptible when the springs are deflected. The steering gear housing is riveted to the front cross member. The steering wheel shaft bears in this and extends backwards at a rakish slant to the aluminum spider of the steering wheel. A tube houses the steering shaft from the dash up to a terminal bearing that carries the hand throttle lever.

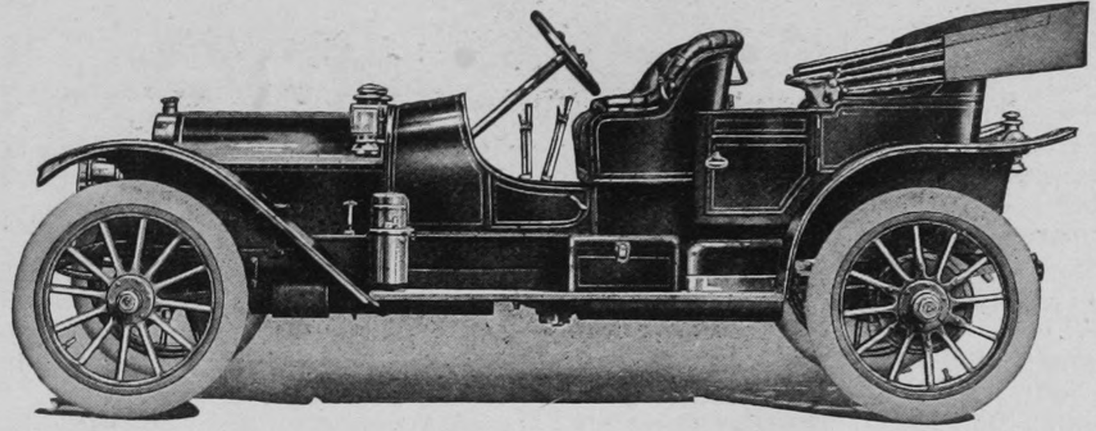
The Rohrbacher Automatic Air Pump Co., formerly of Blaine, Wash., announce that they have moved into larger quarters owing to the demands on them for their auto power tire pumps. They now have a completely equipped plant at Portland, Ore., capable of producing six times the former output.

The Swinehart Clincher Tire & Rubber Co., of Akron, Ohio, notify the trade that they are owners of a tire patent granted to Edwin B. Cadwell, on cushion tires, and that in general cushion tires, having recesses in their side and presenting an unbroken tread surface are an infringement on the said Cadwell patent.

"One hundred and thirty-five thousand new cars for next year will be about the actual output," said tire manufacturer H. S. Firestone in a recent interview. "This estimate we have not based upon the published claims of the makers, but upon the specifications of their purchasing departments, and car makers are not prone to buy more tires for their new cars than they must have. A great many progressive makers have for the first time adopted demountable rims as part of their optional equipment. One of the leaders has gone so far as to include, without extra charge, demountable rims on all cars."

Stevens-Duryea

Motor Cars 1910



Light Touring Roaaster, Four Passenger, Model "X," Twenty-four Horse Power, Price, $2,850.00. In Standard Finish and Equipment. Top, with Slip Cover, $135.00

The new straight line light touring roadster body, with detachable tonneau, as fitted to the Model "X" Chassis, is something exceptional.

Comfort and Protection

Appreciated Features

Upholstery is most luxurious, while the angles of seats and backrests are so arranged that the tourists are afforded a maximum of comfort. Ample protection is made possible by a most practical design of fender. Metal guards extend the entire length of running board and connect with chassis frame, the housing over brake rods being detachable.

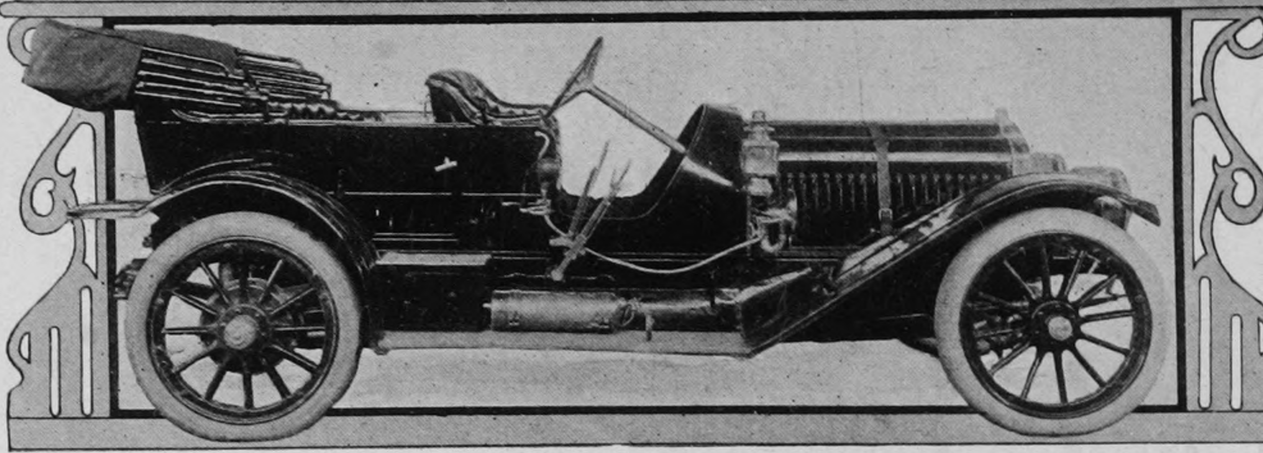
Workmanship, Material and Finish

The highest quality possible

STEVENS-DURYEA CO.

THREE POINT SUPPOR

THE STANDARD SIX



The St. Louis Car Co., of 5200 N. 2d St., St. Louis, Mo., is placing on the market the "Standard Six," a 50 H. P. chassis fitted with either of four bodies. This car which they style "The Car Complete," was so called owing to its being placed on the market fully equipped in every respect. It is strictly a car from manufacturer to purchaser, or one that, when delivered, is fitted with all the equipment commonly used in touring and generally furnished as extras on other cars. The "Standard Six" embodies the most advanced mechanical features approved by both foreign and American practice. It is of high-class design, stylish in appearance and constructed of the best of materials. The chassis is uniform for all styles of bodies. It has a 50 H. P. engine and when fitted with either the touring, miniature or roadster bodies, sells for $3000 or with a luxurious limousine sells for $4000, either style, including the full equipment of two 12 in. Dietz head lamps, one gas generator, two Dietz side and one tail lamps, horn, tool kit tire repair outfit, tire carrier, coat rail, baggage rack, combin tion Warner speedometer and clock, t and side curtains and wind shield.

MOTOR.

The motor of the "Standard Six" is 50 H. P. engine of the six cylinder wat cooled vertical type, with the cylinde cast in pairs. It has a 4½ in. bore ar a 5 in. stroke. The large interchang able inlet and exhaust valves in the hea are mechanically operated from a on piece dropped forged cam shaft and ca be instantly removed by unscrewing or nut. The connecting rods are droppe forged from special steel of I-beam se tion. The cylinders are mounted upon one-piece crank case of approximate cylindrical design, insuring the greate possible rigidity and strength with pe fect alignment of bearings, inspection ar adjustment of which are facilitated l large, accessible hand-holes on both sid of the crank case. The motor is mounte upon a frame by a perfect three-point su pension, relieving it of the great stra due to bad road conditions. The wat

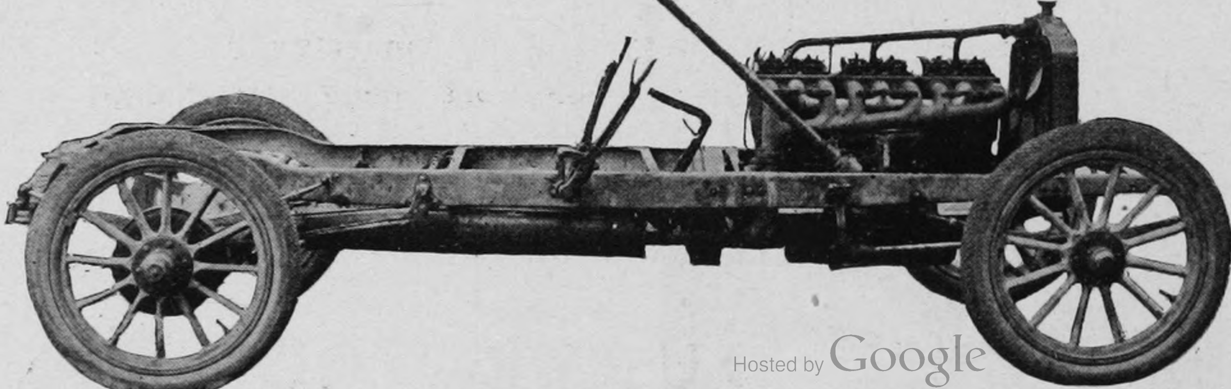


Fig. 1. Chassis of the "Standard Six" miniature tonneau shown in the headpiece; wheel base 124 in., tire

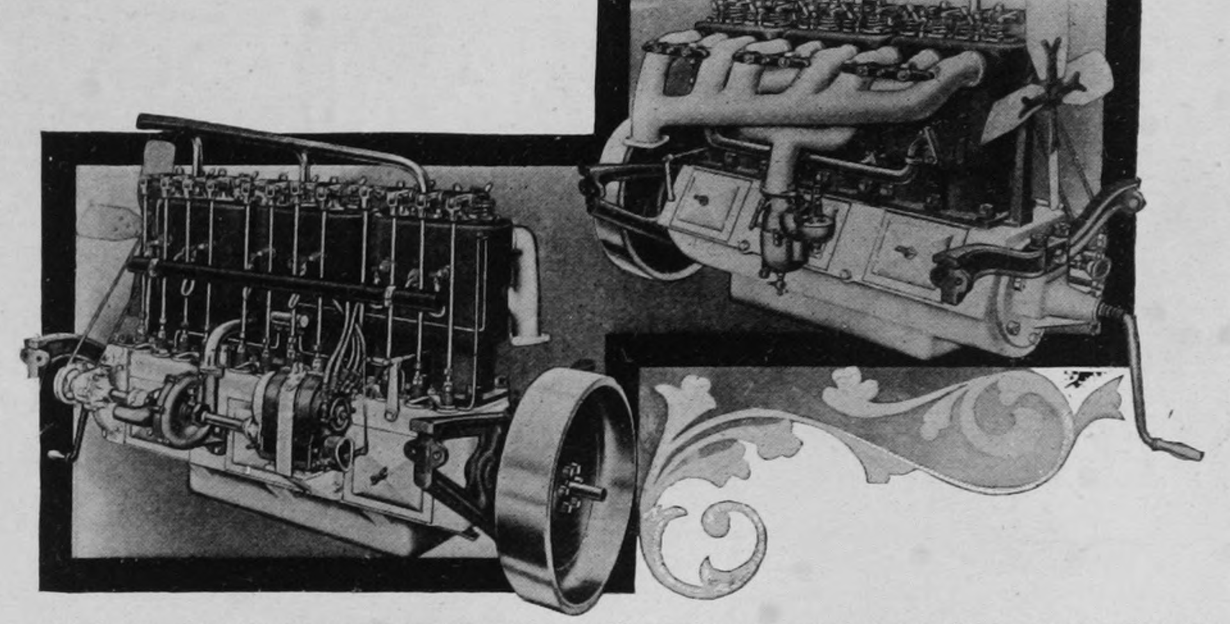
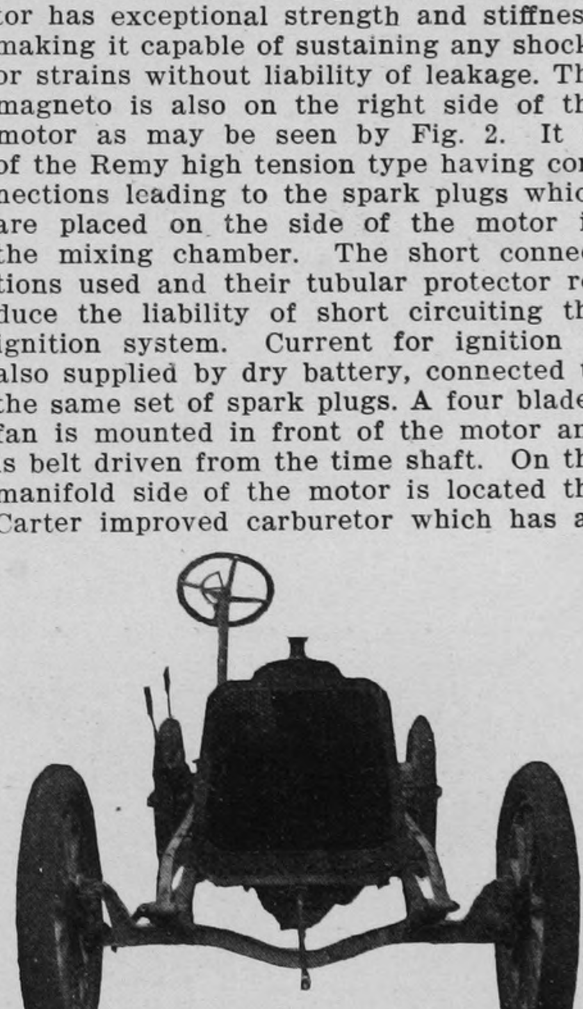


Fig. 2. The 50 H. P. 6-cyl. motor of the "Standard Six;" cylinders cast in pairs, 4½ in. bore, 5 in. stroke, valves in head, water cooled by unusually large jackets, circulation by centrifugal pump by magneto drive shaft, drop-forged connecting rods of I-beam section special steel, crank shaft is one-piece drop-forging of alloy steel; all valves are in the heads and are mechanically operated from one cam shaft.

jackets are cast integral and are of unusual capacity. A positively driven centrifugal pump mounted on the time shaft nsures perfect circulation. The water connections are extra large and the radiator has exceptional strength and stiffness, making it capable of sustaining any shocks or strains without liability of leakage. The magneto is also on the right side of the motor as may be seen by Fig. 2. It is of the Remy high tension type having connections leading to the spark plugs which are placed on the side of the motor in the mixing chamber. The short connections used and their tubular protector reduce the liability of short circuiting the gnition system. Current for ignition is also supplied by dry battery, connected to the same set of spark plugs. A four bladed fan is mounted in front of the motor and s belt driven from the time shaft. On the manifold side of the motor is located the Carter improved carburetor which has an automatic air control adjustable from the dash and is water jacketed.



LUBRICATION.

Lubrication is furnished by splash and pump. The pistons and all bearings are abundantly lubricated by the splash system. The crank chamber holds the oil and is partitioned to prevent the oil from accumulating in either end when the car is on grades. The oil is kept at a constant level by a positive gear-driven pump while the excess overflows into a reservoir beneath the crank case. The system is entirely automatic in operation and requires no adjustment whatever.

CLUTCH AND TRANSMISSION.

The clutch and transmission are constructed in unit. The clutch is of inverted cone type having cork inserts. The transmission is of the sliding gear type and is selectively operated. It has three speeds forward and one reverse. All gears and shafts are of special heat-treated and hardened steel, are ground accurately to size and mounted upon annular bearings.

CONTROL.

The spark and throttle control levers are placed above the steering wheel upon a stationary sector. The steering gear is of the invisible worm and full worm gear type and has adjustments allowing all wear to be compensated for. One of the two hand levers shifts the gears and the other operates the emergency brakes. There are two pedals, one each for the clutch and service brakes.

CHASSIS.

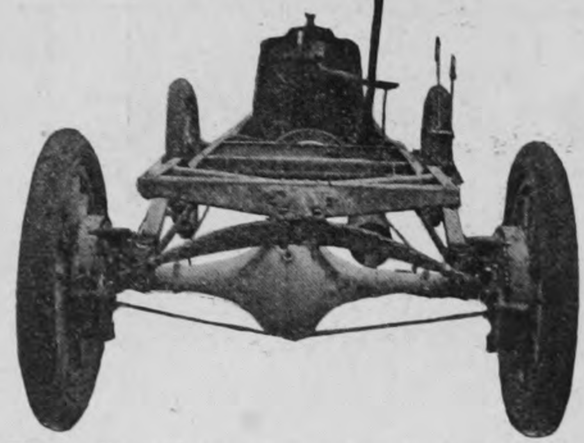


Fig. 4. View of the "Standard Six" chassis from the ear, showing the drop in the frame just forward of the ear axle, the platform springs and the rear axle.

rame is made by the Parish Manufactur- ng Co., of Reading, Pa., and is of chan- el section chrome nickel steel. It is sub- ected to a careful heat treatment, enor- nously strengthening it and enabling it to vithstand the tremendous shocks and trains of severe service. The frame nar- ows in front giving the car a small turn- ng radius and drops at the rear bringing he centre of gravity closer to the ground, hereby conducing to comfort and safety at gh speeds over dangerous roads. The 36 . wheels are of second growth hickory, ave twelve spokes and are mounted on imken roller bearings. They are fitted ith quick detachable rims and 4 in. tires, either Goodrich, Diamond or Firestone ake.

The front axle is of the well known imken roller bearing type and is a solid ne-piece drop forging of I-beam section, ith integral spring seats. The distance

roller bearings. The rear axle shown in Figures 4 and 5, is of the ful floating type, carrying the weight of the loaded car on the heavy pressed stee tube. The rear axle is also fitted with Timken roller bearings.

Two inch springs are used throughout the car. They are of special crucible spring steel and are scientifically designed and tempered. Those in front are semi-elliptic, 40 inches long, while those in the rea are of the platform type, 42 inches long with the cross spring 38 inches long. Al spring joints are lubricated by special oi cups.

The two separate and distinct Raybestos lined brakes operate on the rear wheel drums, which are 16 inches in diameter, with a 2½ inch face. The exterior contracting service brakes are controlled by the pedal while internal expanding brakes are operated by an emergency hand lever.

BODIES AND PRICES.

There are four types of bodies furnished, all of which are of hand hammered metal of graceful lines and luxuriously upholstered. While designed for comfort

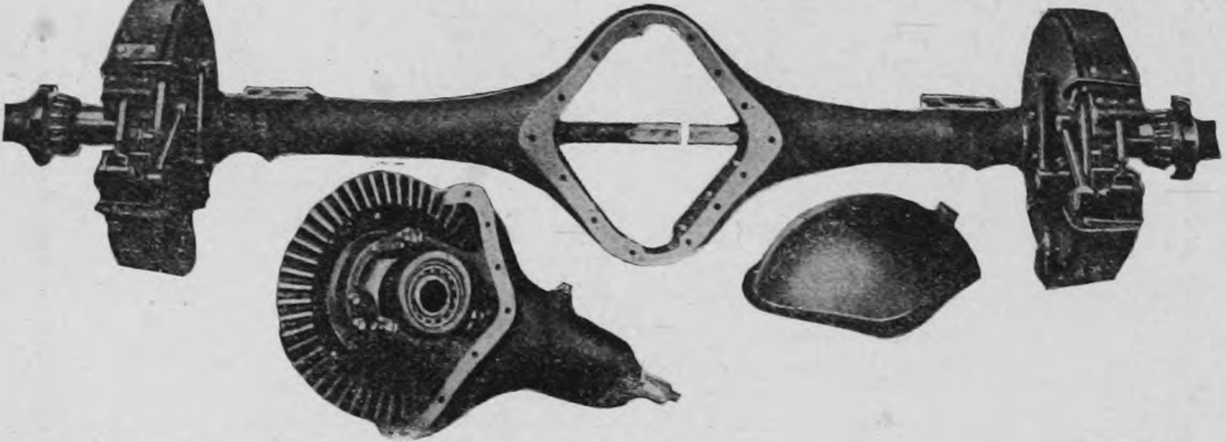


Fig. 5. Full floating rear axle of the "Standard Six." The wheels are mounted on Timken roller bearings. This view shows the axle tube, differential and brakes.

there are no other requirements sacrificed. The model L-N Limousine has a capacity of seven passengers and, as before stated, sells for $4,000. The L-N Touring and L-N Miniature Tonneau models both seat five passengers and together with the L-N Roadster Model, list at $3,000. The Roadster has a seating capacity of three passengers, or with double rumble seat accomodates four. The bodies are finished in either standard red, Napier green, or imperial blue, while the running gear is of cream.

The Westinghouse Storage Battery Com- any, which was incorporated July 12th, as acquired all of the plant, patents, and quipment of the storage battery depart- ent of the Westinghouse Machine Com-

The Los Angeles Motor Racing Association has leased Ascot Park, one of the best equipped mile tracks in the country, for a term of years. They are planning extensive alterations, which have already

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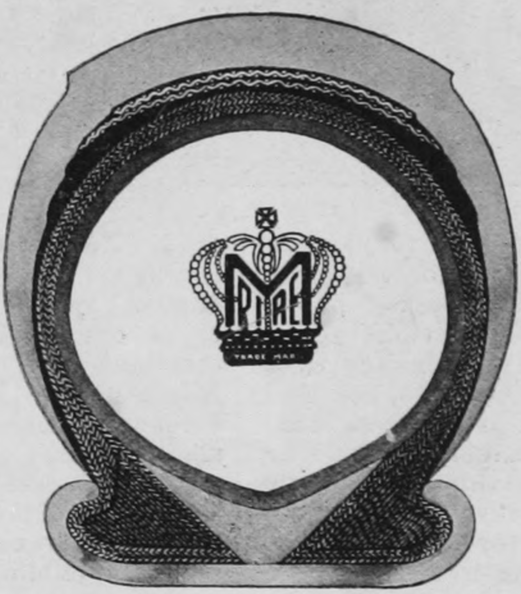
WEAR LONGEST



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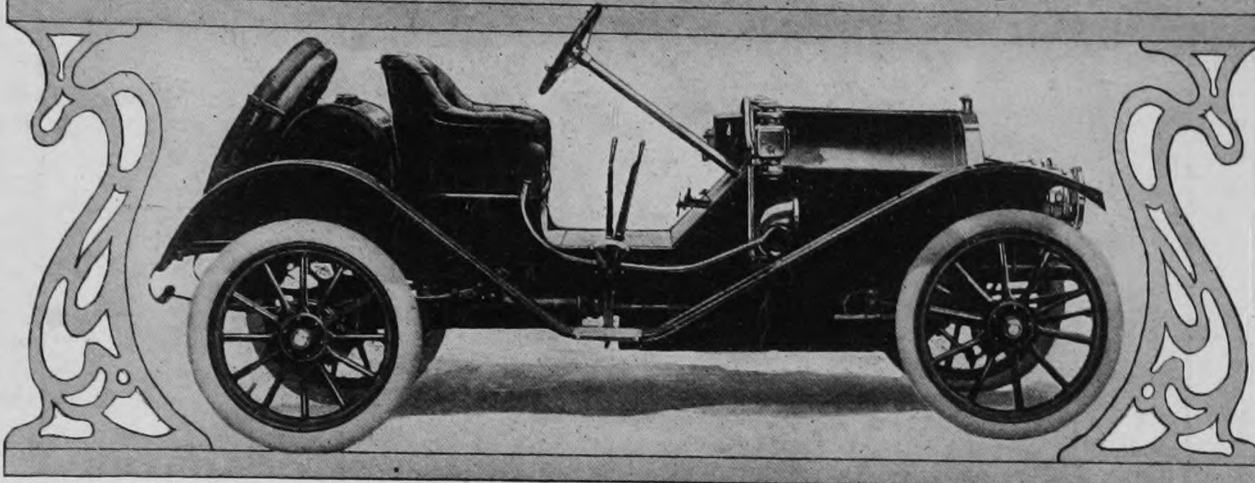
Cleveland, O.—Motor Supply Agency Co.
Dallas, Texas—Southwestern Auto Supply Co.
Denver, Col.—Denver Auto Goods Co.
Jacksonville, Fla.—Savell Rubber Co.
Kansas City, Mo.—Auto Specialty Co.
Los Angeles, Cal.—Empire Tire and Rubber Co.
Minneapolis, Minn.—Empire Tire and Rubber Co.
New Orleans, La.—H. A. Testard.
Norfolk, Va.—Wm. H. Grover.
Pittsburg, Pa.—Consumers' Auto Supply Co.
Portland, Me.—James Bailey Co.
Providence, R. I.—Waite Auto Supply Co.
Salt Lake City—Rooklidge Gilmer Co.
San Francisco, Cal.—H. W. Bogen, Inc.
Savannah, Ga.—Harris Tire Co.
St. Louis, Mo.—Gorman Bros.
Syracuse, N. Y.—Central City Rubber Co.
Toledo, O.—W. G. Nagel Electric Co.

THE 1910 HUDSON



BY C. E. MORRIS.

The season of 1910 is notable for, among other reasons, that more and better general value is offered to the buying public than has been the rule in previous years. In the greater value for less money than has been asked a year or two ago, the 1910 Hudson "Twenty" stands pre-eminent, tangible proof of what is possible in the way of accomplishment when things are done according to a sound, carefully planned system. It is marketed for the first time in the season of 1910 and a word or two concerning its sponsors will be timely. First of all let it be remembered that it emanates from Detroit, Mich., that thriving western city which has become famed because of its product, especially the motor car, the reputation of which the Hudson "Twenty" will perpetuate.

The men behind the Hudson are the fo lowing: J. L. Hudson, president of th Hudson Motor Car Company, is the owr er of one of Detroit's largest and mos thriving dry goods houses, a man of soun judgment and business integrity. He ha extensive interests in other cities and i also identified with other local institutions a man of affairs. Hugh Chalmers, vic president of the Hudson Motor Car Com pany, hardly needs an introduction to th motoring public, he graced the market wit one startling and efficacious creation a sea son or two ago and it has become notable He is also the president of the Chalmers Detroit Motor Car Company, of Detroit. F B. Jackson, the treasurer and general man ager, is a trained mechanical engineer t whom the motor car is a source of inspi

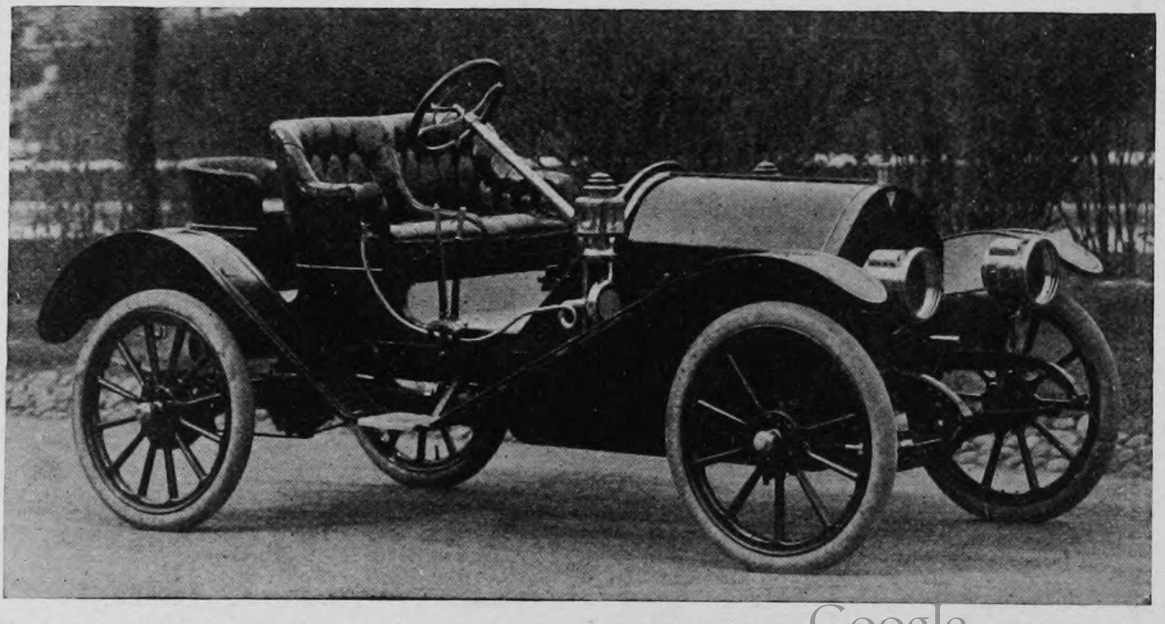


Fig. 1. The 1910 Hudson Twenty. 4-cylinder, wheel base 100 in.; tires 32x3 front and 32x3½ rear; cylinder cast "en bloc;" bore 3¾ in., stroke 4½ in.; valves all on one side; ingition by storage battery, Bosch magne extra; cooling by centrifugal water pump and fan; splash lubrication; selective sliding gear transmission, three

identified with such successful companies as the Olds Motor Works, to say nothing of his numerous other connections. R. D. Chapin is the secretary of the company, and, also treasurer and general manager of the Chalmers-Detroit Company. His experience dates back to the early days and at one time he was sales manager of the Olds Motor Works. George W. Dunham is chief engineer and designer, is a thoroughbred mechanic and to him also the motor car is a thing apart, something worthy of his skill and judgment and the little Hudson "Twenty" reflects the care and thought he has bestowed upon it. After an extensive course of engineering at Swarthmore and Kenyon Colleges, he became affiliated with the American Motor Carriage Company back in 1901 and remained at that post until 1904. He then became associated with the Olds Motor Works, a sterling Michigan organization, and was designer. From 1907 until 1909, that is, up to last March, he was chief engineer of that company and his skill and judgment were amply tangible in the models turned out by the Olds Company. H. E. Coffin, vice president of the Chalmers-Detroit Company, is a director of the Hudson Motor Car Company, and, obviously, is not a man to be associated with something that will not prosper. It is ostensible from the foregoing that the men behind the Hudson, in common parlance, "know their business". It was not their purpose to give the public something cheap at a cheap price but rather something of undisputed

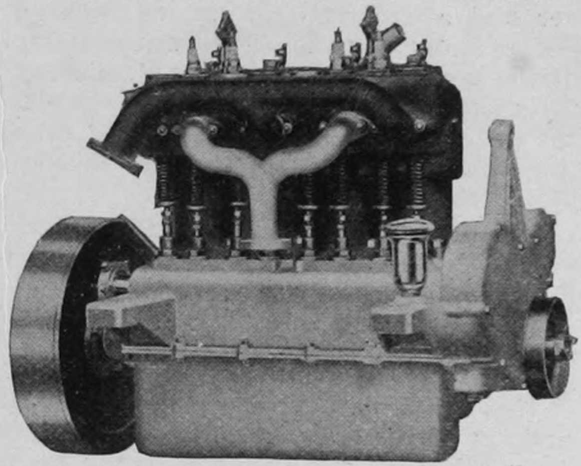


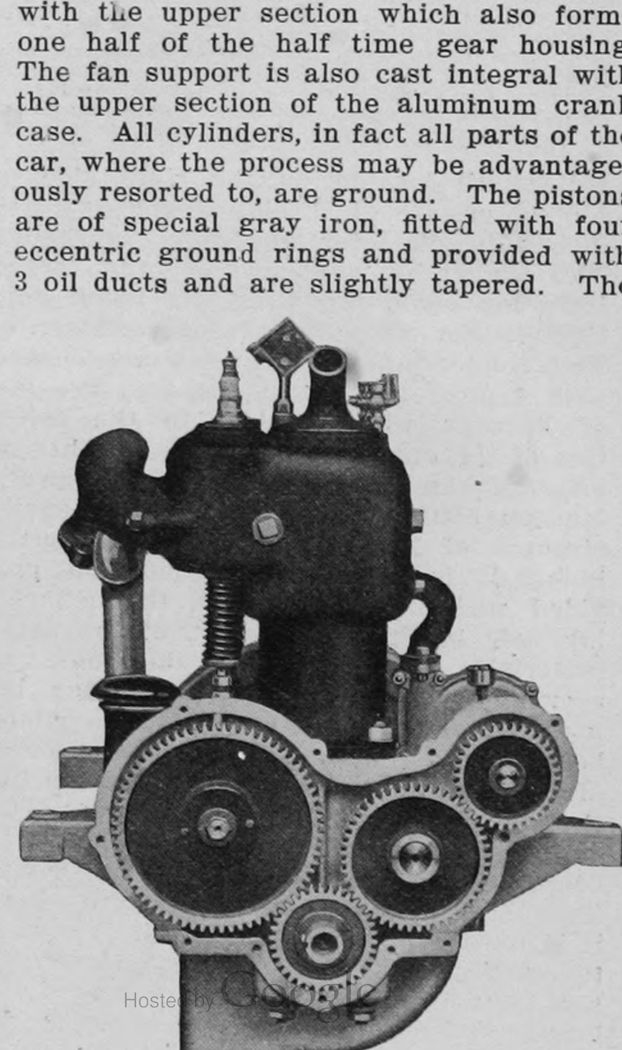
Fig. 2. Right or working side of the Hudson Twenty motor. Note the symmetrical arrangement of exhaust and inlet manifolds; cylinders cast en bloc, manifolds and exhaust are attached separate, the exhaust being cast iron and the inlet alumnium; valves of nickel steel 1½ inches in diameter, all interchangeable, actuated by a single cam shaft, the push rods being adjustable; the aluminum crank case is cast in two sections and parted on the center line of the bearings. The lower section serves as an oil reservoir, supply being renewed through the breather shown at the right forward; the upper section of the crank case forms one half of the motor gear housing and has cast integral with it the fan support; fan driven by a one-inch flat belt from a brass idler at the forward end of the crank shaft, on which is also carried the starting rachet.

it is complete, a finished product. That
can be made so is due to the policy adopt
at the start, "one car and make that a
good as you know how."

MOTOR.

The motor of the Hudson "Twenty
shown in Figs. 2 and 3, is of the so-calle
Renault type, that is the familiar L pa
tern having the valves all on one side c
the motor, actuated by a single cam. Th
cylinders are cast "en bloc," or, in on
solid casting as shown in Fig. 1, with in
tegral water jackets, the bore being 3^{3}
inches and the stroke 4½ inches. Th
crank shaft is of the well known two bear
ing type. The cylinders are cast of select
ed gray iron with liberal water jacketin
completely surrounding the valve chan
bers ensuring the maximum of efficienc
at this point. While the cylinders are cas
"en bloc", the Hudson sponsors have re
frained from carrying the construction
step further, that is the inlet and exhaus
manifolds are separate.

The crank case is of aluminum parte
on the center line of the motor bearing
the supporting arms being cast integra
with the upper section which also form
one half of the half time gear housing
The fan support is also cast integral with
the upper section of the aluminum cranl
case. All cylinders, in fact all parts of the
car, where the process may be advantage
ously resorted to, are ground. The piston
are of special gray iron, fitted with fou
eccentric ground rings and provided with
3 oil ducts and are slightly tapered. The



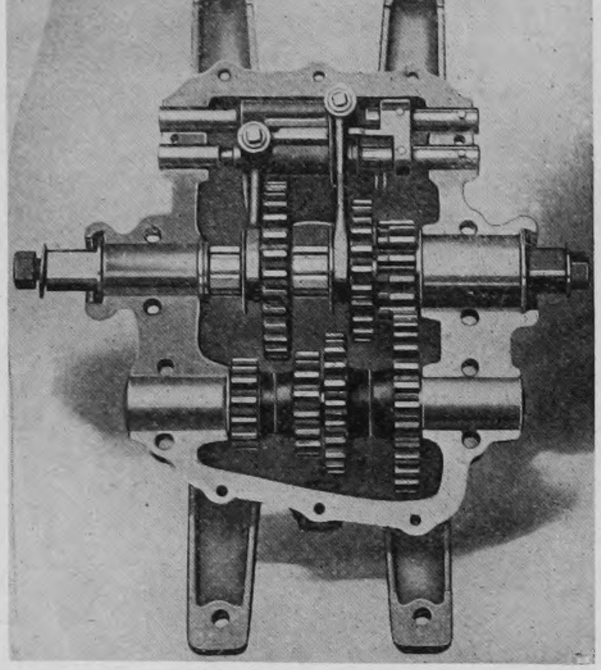


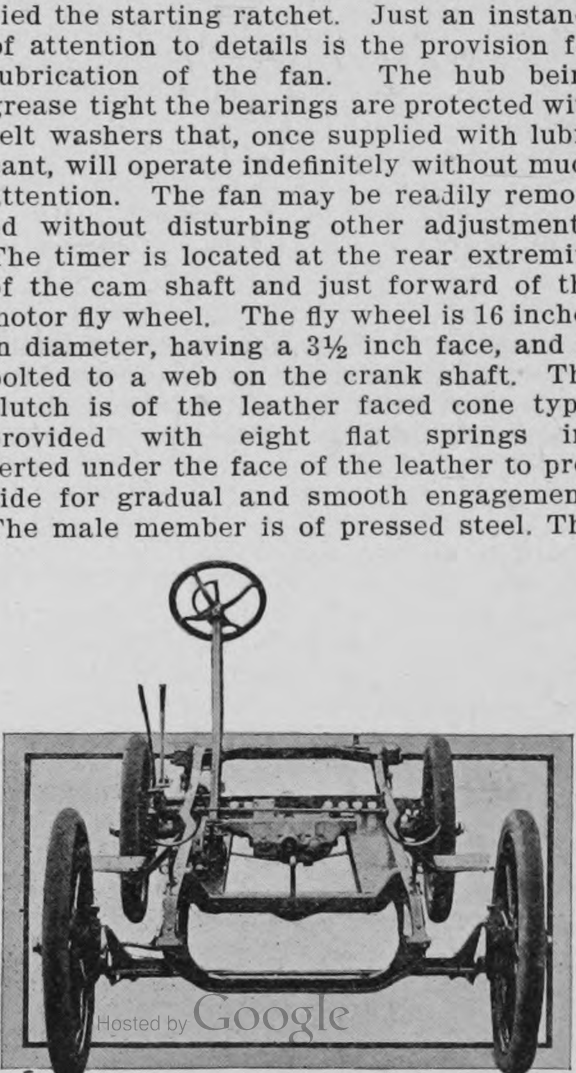
Fig. 4. Hudson Twenty selective sliding gear transmission; three speeds forward and reverse; the aluminum housing is parted horizontally and supported on four arms cast integral with the lower section; shafts are of high grade open hearth steel carefully heat treated and ground and supported in large plain die cast bearings, and provided with oil retaining chambers on outer ends of main bearings; counter shaft bearings are closed in solid, oil pockets over each bearing on inside of case; gears have ⅝ and ¾ inch face, stub teeth 6-8 pitch, shifting gears driven by four integral keys on main shaft, fixed gears being keyed with abutting ends or hubs and a shouldered shaft; taking the end thrust directly against the bearings.

valves, all located on the right side of the motor, are of special nickel steel 1½ nches in diameter and interchangeable. The connecting rods are of drop forged section steel, the wrist pin being held ight in the piston by a single set screw. The connecting rod bearings are bushed with bronze and all motor bearings are f Parsons white brass. In the selection of the crank shaft the best quality ot naterial has been specified, in fact every Hudson shaft must test up to a tensile trength of 100,000 pounds to the square nch. It is also heat treated and provided with liberal bearings, the connecting rods being, by the way, of the same naterial. All crank shaft bearings are ccurately ground to size, bearings being 2⅛ inches in diameter. The motor earings are retained to the upper section f the crank case, the lower section serving he sole purpose of an oil reservoir. The notor is especially staunch throughout in onstruction and the crank case is heavily-webbed providing added strength where t is most likely to be required. The motor casting is held to the crank case with en ½ inch studs. The timing gears are ronze and steel and operate in grease in grease tight case, integral with the crank

to the upper section of the crank case an provided with adjustment. While th source of current is by storage battery provision is made for Bosch magnet which is furnished as special equipment, i which case it is located at the left rear o the motor, drive being through universa joint from the water pump shaft which i turn is driven off the half time gears. Ignition cables are of special covered rubber and are carried in guides secured t the cylinder-heads. The water pump i of the centrifugal type located midway o the cylinder sets, supply being drawn fron the base of the radiator, circulated throug the jackets passing out through the dome of the cylinders.

The radiator of this car is of neat vertical tube design being built of copper an brass and supported at three points. It i 2½ inches deep, the width of the coolin surface being 24 1-16 with a height of 19½ inches.

The fan is provided with ball bearing and is driven by a one-inch flat bel from a brass idler attached to the forwar end of the crank shaft on which is also carried the starting ratchet. Just an instanc of attention to details is the provision fo lubrication of the fan. The hub bein grease tight the bearings are protected with felt washers that, once supplied with lubricant, will operate indefinitely without much attention. The fan may be readily removed without disturbing other adjustments The timer is located at the rear extremity of the cam shaft and just forward of th motor fly wheel. The fly wheel is 16 inche in diameter, having a 3½ inch face, and i bolted to a web on the crank shaft. The clutch is of the leather faced cone type provided with eight flat springs inserted under the face of the leather to provide for gradual and smooth engagement The male member is of pressed steel. The



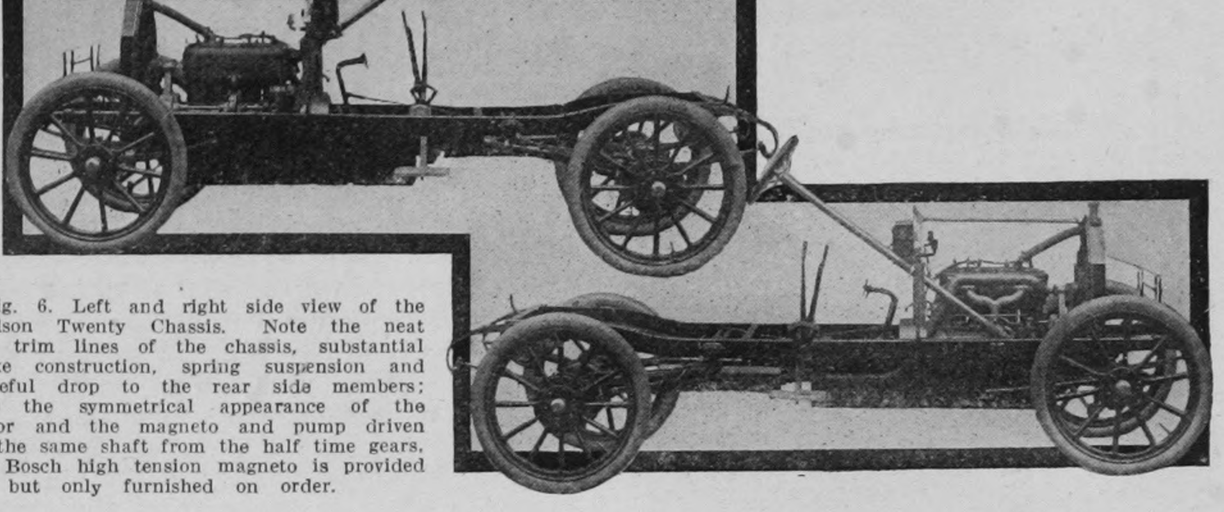


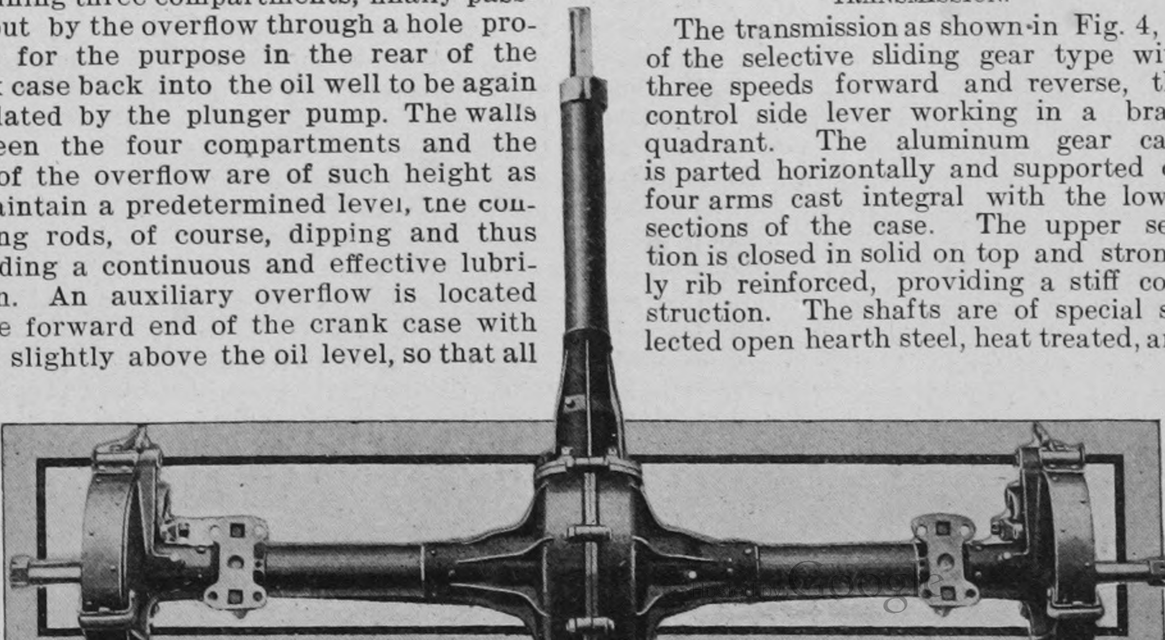
Fig. 6. Left and right side view of the Hudson Twenty Chassis. Note the neat and trim lines of the chassis, substantial brake construction, spring suspension and graceful drop to the rear side members; also the symmetrical appearance of the motor and the magneto and pump driven off the same shaft from the half time gears. the Bosch high tension magneto is provided for but only furnished on order.

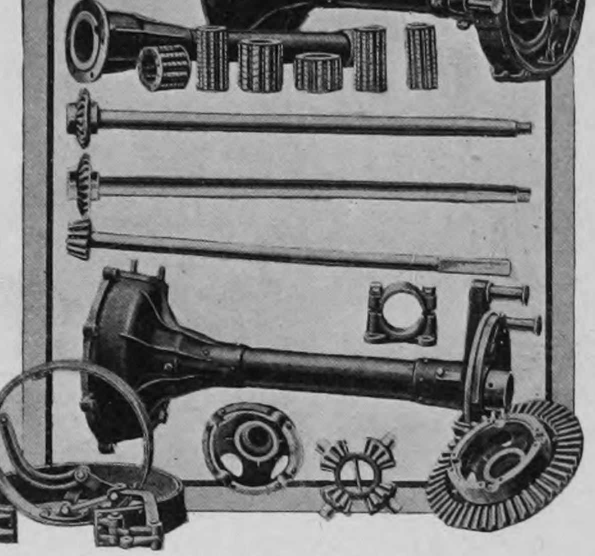
inlet manifold is of ample dimensions and bolted to the motor casting with four ½ inch steel studs, the exhaust being of cast iron and retained by six ½ inch steel studs. There is not a sharp angle to deflect the incoming or outgoing gases. The spark plugs are carried over the inlet valves and each cylinder is provided with a compression relief cock. The face of the motor fly wheel is marked off so that the setting of valves when recourse to such operation may become expedient is rendered a simple matter. The core plate of the cylinder sets is of cast iron retained by four ½ inch steel studs.

Lubrication is by splash, the main supply being carried in the lower section of the crank case, and this is circulated by means of a plunger pump actuated from the cam shaft. The pump lifts the oil from the well or reservoir and forces it into the forward compartment of the crank case and from here it overflows back into the remaining three compartments, finally passing out by the overflow through a hole provided for the purpose in the rear of the crank case back into the oil well to be again circulated by the plunger pump. The walls between the four compartments and the side of the overflow are of such height as to maintain a predetermined level, the connecting rods, of course, dipping and thus providing a continuous and effective lubrication. An auxiliary overflow is located at the forward end of the crank case with walls slightly above the oil level, so that all possibility of the forward compartments flooding when that end is inclined downward is precluded. Maximum and minimum try cocks are provided at the side of the oil well and a breather tube located at the right forward of the motor provides access for filling, the breather being fitted with a locking device cap. The carburetor is of the latest approved type, that is the Venturi tube, with ball auxiliary valves and is especially designed for use on the Hudson "Twenty". It provides for a wide range of speeds on all gears from high speed work in the open country to slow high gear travel in close city traffic. It is likewise very responsive and sensitive to the throttle and provides a uniform mixture under the varying climatic conditions. The muffler is of neat design and affords a very silent exhaust, the steel tubing carrying the spent gases from the exhaust manifold to the muffler being 1¾ inches in diameter.

TRANSMISSION.

The transmission as shown in Fig. 4, is of the selective sliding gear type with three speeds forward and reverse, the control side lever working in a brass quadrant. The aluminum gear case is parted horizontally and supported on four arms cast integral with the lower sections of the case. The upper section is closed in solid on top and strongly rib reinforced, providing a stiff construction. The shafts are of special selected open hearth steel, heat treated, and





'ig. 8. The rear axle of the Hudson Twenty dissassem-
d, showing the internal and external brakes, the Hyatt
er bearings, the driving shafts, propeller shaft, torsion
e and differential gears.

curately ground. Bearings are of Par-
ns' white brass and fitted with oil retain-
g chambers on the outer extremities of
e main bearings, while the counter shaft
arings are closed in solid. Oil pockets
e arranged over each bearing on the in-
le of the case with large ducts passing
rough the bearings proper, there being
tained in each bearing duct, three lay-
s of 80 mesh brass wire gauze ensuring
'solute filtering of the oil in circulation.
ears are of the best selected stock, that
open hearth steel, carefully heat treat-
and ground and hardened. The gears
e of ⅝ and ¾ inch face and cut accord-
g to the most approved methods with
ub teeth having a 6-8 pitch, and are
inted to provide for easy shift. The
ifting gears are actuated by four keys in-
gral with the main shaft, the fixed gears
ing firmly keyed with abutting hubs and
shouldered shaft, thus taking the end
rust directly against the bearings. The
sitive clutch is of the integral gear type
hich renders the shift to third speed es-
cially quiet. The shifting mechanism
nsists of two forks with long hubs sliding
stationary bars and a spring ball check
carried in each sliding member which
ops into a groove provided in the sta-
onary bars and registering with the vari-
s gear positions. A simple and effective
terlock is provided so that to operate
ore than one train of gears simultaneous-
is an impossibility. Lubrication of gears
of course by splash and the supply may
removed through the drain plug and re-
wed through the filler as often as neces-
y may require. Final drive is by pro-
ller shaft of nickel steel 1⅛ inches in

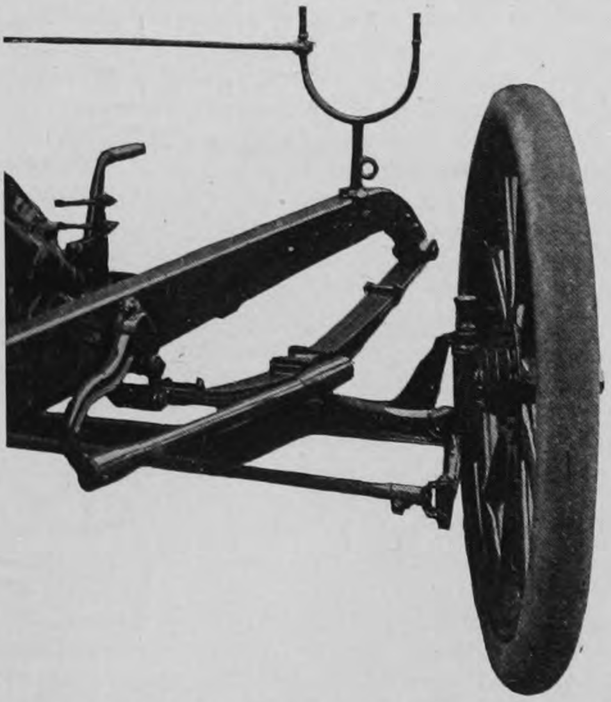
in a block and trunion type of universal joint with a short propeller shaft to a similar joint on the forward end of the main transmission shaft. The wearing surfaces of these joints are carefully ground and hardened and a tubular leather boot is clamped over the abutting ends and filled with grease which provides ample lubrication for both joints and clutch spring and, in addition, a grease cup still further ensures proper lubrication of the working elements. The double universal joints compensate for uneven road conditions and provide for the easy removal of the clutch. The rear universal joint is of the pin type located directly to the rear of the transmission, delivering the power to the rear axle shaft and resisting the torque of the axle drive by means of the tubular steel casing concentric with the propellor shaft. The wearing surfaces of the rear joint are of ample dimensions capable of resisting long hard service and are of high grade steel carefully heat treated, hardened and ground. The working elements of the joint are enclosed in an oil tight case and when this is filled with lubricant, it suffices for two or three thousand miles of driving. A filler hole renders renewal of lubricant an easy and simple operation.

THE CHASSIS.

The chassis, shown in figures 5 and 6, is of pressed steel hot riveted channel section, formed while hot in a hydraulic press. The side members are of 1½ inches by 3½ inches channel section inswept forward, providing a short turning radius, upswept to the rear for ample clearance over the rear axle, wth a drop of 2½ inches. The transverse members as well as the sub-frame are of pressed steel and rigid construction, provided wtih gusset plates. Both motor and transmission are supported on the pressed steel sub-frame, running board brackets are of drop forged steel. A generous underpan protects the working members from the elements and is easily removed when necessary.

The rear axle, figures 7 and 8, is of the semi-floating type fitted with Hyatt roller bearings, the wheels being keyed to the tapered outer extremities of the axles. The differential case is of cast steel heavily outside webbed; and the axle steel heavily outside webbed; and the axle tubes are of the best quality drawn steel and carry the weight of the car load. The bearings are of ample sized hardened and ground rollers running on surfaces similarly treated with all end thrust compensated for by ball thrust bearings. The bevel gear plugs provide for withdrawal and replenishment of lubricant. The filler hole is located at such a height that too much oil can not be poured into the case. This of course obivates all leakage along the driving axles to the brakes. The differential housing is provided with a truss rod. The rear springs oscillate on the axle tubes and are provided with grease cups. The front axle is of the well known I-beam section drop forged type having integral spring seats, the whole member being forged of the quality stock in one piece and is heat treated. The steering spindles shown in Fig. 9, pivot on hardened and grown bearings and are supported in the wheels on concave and cone and race ball bearings. The steering assembly is carried to the rear of the front axle, tubular steel being used in the construction, there being ample provision for take up for wear. The front axle of the "Hudson" is located well forward of the radiator which adds materially to the appearance of the car. Many contemporary machines are still built with the overhang over the front axle. In the former instance there is an even distribution of weight and steering is a much simpler matter by all means.

As for brakes, the "Hudson Twenty" is well provided for, there being two sets, independent of each other working through on rear wheel pressed steel drums, having a 2 inch face. The service brake is of the contracting band type actuated by the pedal, the emergency brake being brought into play by the hand lever and working the integral expanding bands, lining being



Twenty" is of the most approved patte semi-elliptic forward and three-quart scroll elliptic rear. Not only are the axl provided with spring seats but heavy plat or saddles are carried at the tops of t spring sets, there being two clips to ea spring provided with extra heavy nuts wi ½ inch diameter thread. The front me bers are 36 inches long and 1¾ inch wide, there being five graded leaves in t fore and seven in the rear sets. The re sets are of 2¼ inch face 46 inches long su ported on a rigid pin forward to the chas and on a 21¼ inch scroll at the rear. T forward halves of the rear springs tra mit the thrust of the axles to the chass

Wheels are of wood, artillery pattern t spokes front and 12 spokes rear mater being selected second growth hicko Tires are 32x3 forward and 32x3½ re The wheel base is 100 inches and the tre 54 inches, though for southern trade inch tread will be furnished.

CONTROL.

The steering gear is irreversible, of wo and gear type. The steering column is 1 inches in diameter and is given a comfo able rake which adds materially to t racey appearance of the car. The steeri wheel is 16 inches in diameter, oval ri med with the spark and throttle levers cated above the wheel working on a st tionary quadrant having a range of abo 180 degrees, the levers are moved forwa to adance and to the rear to retard. accelerator pedal is also provided and located between the brake and clut pedals, convenient to the reach of t operator. Clutch pedals are of select cast steel and are adjusted to any length foot reach. The left pedal works the clut and the right the external contracting bra bands on the rear wheel drums. T pedal pads which are integral with t arms are of semi stirrup design and ha pyramid surfaces ensuring a firm gr Both levers are carried on a steel tube rocker shaft, the brake pedal being key direct to this bar though the clutch pe oscillates on the tube while a smaller me ber acting in conjunction with it is fast ed to a rocker shaft. The clutch releasi yoke is of bronze retained by two dr forged steel levers and is provided with grease cup. A set screw regulates the movement on the clutch pedal, the pe proper being kept in contact with the sma er member by means of a heavy coil spri

The owner of a "'Hudson Twenty" ne never fear of some unauthorized pa making off with his car for he can obvi all that by removing the starting cra loosening up slightly on the ball check the crank may be withdrawn. This is easily accomplished by bringing it to a horizontal position which allows the clutch pin to register with two slots provided for the purpose. A smooth brass grip turning freely on the crank handle spindle is fitted.

THE BODY.

The "Hudson Twenty" may be had equipped with a runabout body and a rumble seat with folding back, or, if desired, a 25 gallon gasoline tank may be substituted for this rear seat. A body of this type is shown in the headpiece. All Hudson bodies are of selected No. 1 grade of ash and poplar and each is given 12 coats of paint. Trimming is of the best available material. The body is secured to the chassis by four large through bolts and rubber shims obviate that squeak so often heard on some otherwise satisfactory cars. The dash is of mahogany of the best five ply stock and of the neat and trim flat type, the edges being bound in heavy brass moulding. The bonnet ledge is of cast aluminum and supports the radiator brace rod. The bonnet is of metal and secured with a spring and hook type of fastener, the top joint being held by means of a heavy brass piano hinge. Another desirable feature of the "Hudson Twenty" is the fender equipment which is ample to ensure perfect protection from flying road matter. The Hudson fenders and mud guards are graceful in design, curving well down over the wheels, checking all flying mud and the like. These are re-enforced and rigidly secured to the fender irons and bolted to a neat and clean cut aluminum step. All vibration is obviated by proper and efficient anchorage. The regular "Hudson Twenty" equipment includes five high grade lamps and a generator, horn, complete tool equipment and the like. Lamp brackets, hand control levers, etc., are of high drop forged steel, no casting being used except in one or two instances where this form of construction is rather to be preferred. The price of the Hudson is $900 f. o. b. Detroit.

ON THE ROAD.

While at the Hudson factory, the writer was given a demonstration in one of the 1910 four-cylinder Hudson Twenties in the course of which various roads were traversed, and, it may be well to mention that all this occurred in the rain. As a speed test a run was taken out over one of the best stretches that abound in that section, and the little car showed up remarkably well at high speed. Quiet action is a feature of the car at high sustained speed, and it holds the road remarkably well; there is that absence of side sway so noticeable on many light cars. The engine, both on the level and taking grades, was consistent in performance and the clutch action was very satisfactory, and just to prove that the gears could be shifted from one speed to another very quietly the operator went through the three speeds. The motor was especially responsive to the throttle and regardless of what the load might be, the performance was consistent throughout. Shortly after leaving the factory a rain storm blew up, accompanied by a stiff gale. Then just to demonstrate that the little car could traverse deep sand and mud the driver hit for the open country, where the roads are mere apologies. One vehicle after another of all descriptions follow along in the wake of the one preceding so that deep ruts are the result. Rain the day before rendered this particular stretch not the best imaginable. In some places deep pools of water were encountered and the manner in which the car held the road was commendable. The spring action was most satisfactory, and there was not that decided harsh action so often apparent in some cars, but rather a smooth easy rise and fall devoid of discomfort and one was not trounced all over the seat. As for operation of the high gear, the car can be throttled down sufficiently slow to permit of operation through the city streets, and proved to be exceptionally quick on the pick up. The clutch took hold gradually, there was no jerk or any indication of harsh engagement, just a smooth sweet action. The springs inserted under the face of the leather provide for a smooth pick-up, and a demonstration of the clutch while plowing through the deep Michigan sand was sufficient to prove conclusively that it is possessed of all the merit claimed for it by the makers. Then, again, when the slow speed was resorted to by way of test the engine behaved wonderfully well, vibration was conspicuous for its absence. The cross stay on the lamp brackets obviates annoying rattle. Back on the level stretch for another run through the open after plowing through the sand the smooth stretch was a welcome relief, and a little top speed was indulged in. The little car rolled along mile after mile with apparent ease, no sign of strain or overwork being apparent. From one speed to another and through the full range of the control various stunts were indulged in to show whether or not the car would perform consistently, and the results were most satisfactory.

At the recent annual meeting of the Standard Roller Bearing Company of Philadelphia, held last week, the directors were elected for the ensuing year, and formally elected the following officers for the ensuing year: President, Lenox Smith; Vice-President, W. B. Osgood Field; Vice-President and General Manager, R. S. Woodward, Jr.; Secretary and Treasurer, W. M. Baldwin.

CASTINGS ON TIME
XII
I
II
III
IIII
V
VI
VII
VIII
IX
X
XI
MILLETT

YOU are always sure of having your castings delivered on time, if they are **MILLETT** made. We have one of the largest foundries in the country and an extensive force of experienced workmen, so that there are no annoying delays—which is an important consideration to the motor car manufacturer.

We can give you anything you want in
Aluminum, Aluminum Bronze, Manganese Bronze, Bearing Metals and Special Mixtures.

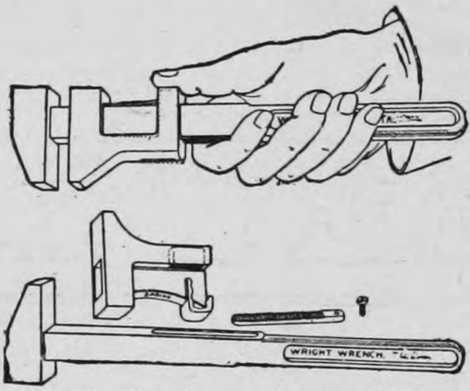
Millett Brass Company, Highland Station, **Springfield, Mass.**

tured by the Wright Wrench Mfg. Co., of 922-24 S. Market street, Canton, Ohio, while designed to do the work of the ordinary wrench is a radical departure from other wrenches in construction.

It is made without a screw and is adjusted to fit the nut by means of a slight pressure upon the jaw with the thumb of the hand holding the wrench. It will be seen that this requires but one hand to adjust and operate the wrench leaving the other free for other purposes. It can be used equally well with either hand. The wrench is made of drop forged steel, carbonized and mottled and consists of six parts, namely, the bar which forms the handle and head; the jaw; the pawl, set into jaw; the rack which when the wrench is put together is set into the bar and is held in place by a set screw and the spring.

Wrench
The "Wright"

When the jaw is adjusted to fit the nut the pressure is taken off the spring and immediately the pawl engages the rack holding the jaw firmly in position. The pawl and rack each have a set of ratchet-like teeth which fit into each other and prevent the jaw from having any play after it is once set. The jaw is instantly released from the nut, however, by a slight pressure upon the spring. While the wrench is in use the spring has no strain upon it whatever.

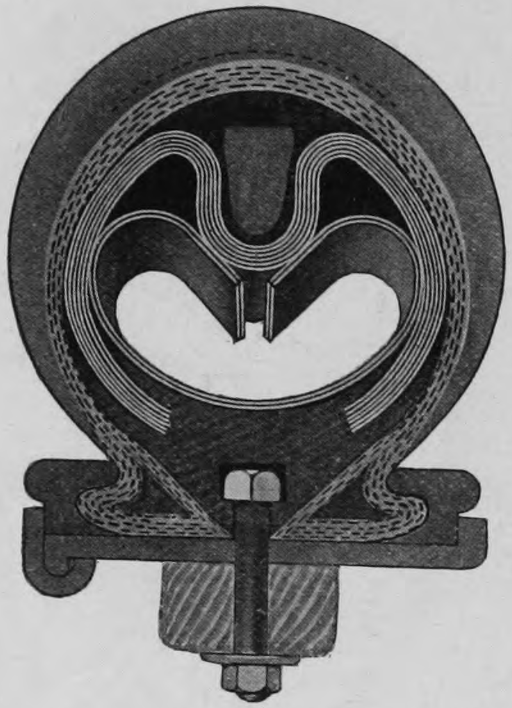


The "Wright" Wrench. It is operated by applying pressure with the thumb as shown in cut.

The standard wrenches are made in 6-in., -in., 10-in., 12-in., 15-in., and 18-in. sizes, nd the automobile wrench in 8-in. to 10-n. sizes.

Spring Cushion Tire which is claimed t eliminate all tire troubles. This tire i manufactured by the W. D. Cushion Tir Company of 107-9 West 27th Street, Ne York City.

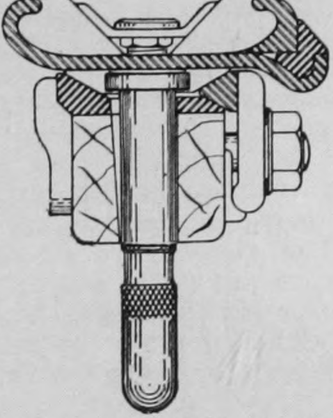
The construction of this tire involve the use of a series of steel springs abou one inch wide, placed one after the othe inside the shoe and entirely around the circumference of the rim. Each steel cushion performs its own functions of resiliency and resists any penetration of th outer casing. It is stiff but flexible unde strain only to the point of necessity an is said to prevent wear at any place excep the tread. A leather cushion protects th inside of the "shoe" from sharp contac with the steel cushion. These spring cushions are made to fit all sizes an makes of clincher tires.


The "W. D." Spring Cushion Tire.

THE FIRESTONE DEMOUNTABLE RIM

The 1910 Firestone Demountable Rim for all quick detachable and clincher tire is illustrated herewith. When used wit quick detachable tires this rim permits o repeated tire changes while on the road even after the motorist has used up hi spare tires. Such changes may be made right from the wheel without reference t the demountable feature and wholly independent of it.

This facility is made possible by use o a sleeve which fits over the valve stem



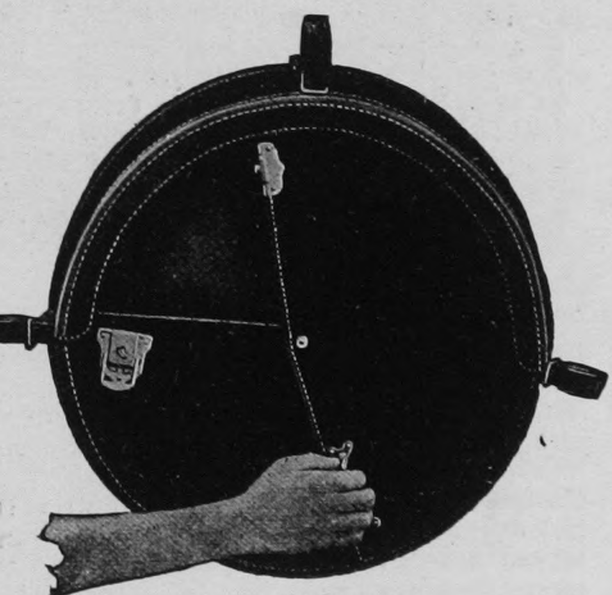
The Firestone demountable rim, showing sleeve.

elease it when the motorist wishes to emove his tire and tube. During this peration the sleeve remains unchanged its position in the hole in the felloe. Vhen the rim is demounted in the regu-r way the sleeve, dust cap, etc., slide rough the hole in the felloe.

The Firestone Tire & Rubber Co., of kron, Ohio, has now practically discard-d exclusive clincher demountable rims n account of the staybolt nuisance. They ave done this in view of the fact that heir new rims do away with staybolts nd make it a very simple matter to fit re on the spare, detached rim.

A NEW TIRE TRUNK

One of the latest tire trunks placed on he market is the "Wohlfeld," manufac-ured by S. Wohlfeld & Company, 538-40 orth Third Street, Philadelphia. The nain feature of this trunk lies in the fact hat it is absolutely water and dust proof. The front and back are made of three-ply eneer, and the sides formed of heavy fibre board. The same is leather bound, hand-titched, covered with black enameled

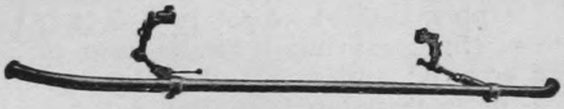


The "Wohlfeld" Tire Trunk.

the machine is being washed is absolutely impervious to water. It lists at $13.50.

THE "VASCO" BUMPER

The Victor Auto Supply Manufacturing Co., of 42-44 West 43rd street, New York City, has recently placed on the market the "Vasco" bumper which can be attached to any car without drilling holes into the framework of the car, thereby weakening the parts.



The "Vasco" Bumper.

It can be applied with a wrench in half an hour. The bumper tube is of heavy steel and has a heavy gauge brass shell drawn over it. A heavy square steel spring is fitted, which is very long and stiff, and gives a range of 3½ inches absorption force and is capable of taking care of a hard blow without shock, and absolutely prevents the breaking of head lamps or radiator. The springs are concealed in telescope tubes. All other parts of the bumper are made of a superior grade of highly polished solid brass.

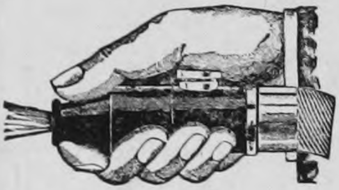
INDIAN REFINING CO'S AUTO OILS.

The Indian Refining Company, First National Bank Building, Cincinnati, Ohio, manufacturers of gasoline, kerosene, naphtha, greases, waxes and oils are the makers of four grades of automobile oil. This oil has been put through a special severe test and has been found to be up to the standard and perfectly satisfactory in every way. It is claimed to be free from carbon and to lubricate perfectly.

The "Indian Auto Oil" is light golden in color and has an excellent body with a low chilling point. It is adapted for both summer and winter use. The "Automobile A Oil," another grade, is of good quality, but not quite equal to the "Indian Oil." It has, however, a good cold test for winter use. The "Automobile AA Oil" is heavier than that just mentioned and is used to good advantage in summer time while the "Special Auto Oil" is a light red anti-carbon oil. The prices are furnished upon application to the company.

The Panama Oil and Grease Co., 159-61 West 51st street, New York City, manufacture Panama Special Auto Oils and Pana

The "Eureka" Self Closing Nozzle is manufactured by Geo. Grosselfinger, 192 Front St., New York City, and is made in ¾ and 1 in. sizes. It is so designed that it is necessary to keep the nozzle in the hand as long as the flow of water is required. There is a plunger button on the nozzle which controls the supply and when not in use it is kept closed by a spring. The nozzle is rubber covered and has a flexible tip which can be manipulated similar to the open end of a hose. Accidental contact with the polished surface of an automobile will not scar nor scratch the same. It is claimed this nozzle reduces the water bill of the garage from fifty to seventy-five per cent.; a very important item in some localities and where large quantities of water are used.



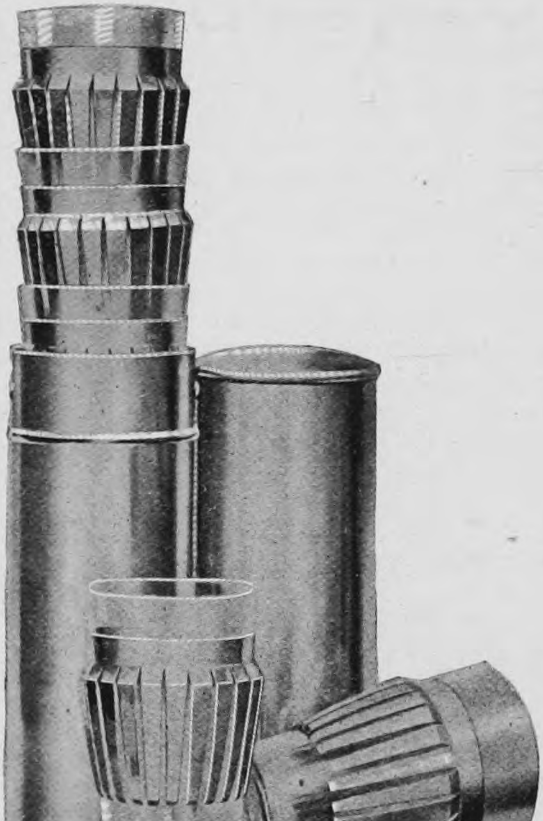
The "Eureka" Self-Closing Nozzle.

THE "BALDWIN" TUMBLER CARRIER

This device meets in every way the demand of the automobile tourist for a safe and clean method of carrying a number of drinking glasses.

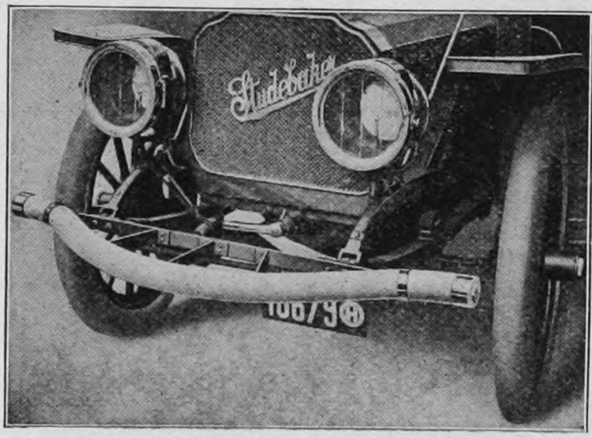
Each tumbler is held in a nickel spring holder which acts as a cushion and protects the tumblers when nested, protects

tumbler is filled with hot liquid, or fro the moisture on the outside of the glass i it contains ice cold liquid. Nested withi these holders and held between a top an bottom spring, the tumblers cannot b broken. The tumblers may be remove from and replaced in the carrier instantly, and being nested occupy but littl space. The glasses are all of the sam size and are put up in sets of two, thre four, five or six tumblers. The cases ar made in nickel or brass (bright or dull finish) and can also be had covered in blu red, seal brown or dark green morocc The prices are $2.50 to $3.50, according t size, and 75 cents to $1.00 additional i charged extra for morocco covering. Th Baldwin Tumbler Carrier, Inc., 143-5 Federal street, Boston, Mass., are manufacturers of this article.



THE WELTON AUTO FENDER.

Something new in the line of automobile fenders has been produced and pu on the market by the Welton Auto Fende Co., of 518 Columbus Savings and Trus Building, Columbus, Ohio. This fender, illustrated herewith, consists of a 3-16x in. frame of fine steel with riveted joints



The Welton Auto Fender.

in front of which is a 3-16x3 in. stee rim, rounded to a segment of a 2½ in circle. Upon this is mounted a solid rubber cushion tire having a brass cap o either end and clips around the whol where there are any short bends. It i claimed this fender greatly reduces th repair bill in case of an accident, and where the same is slight, protects th lamps, springs, tires and radiator, which otherwise might be badly damaged.

"NUGGET" BODY POLISH

This polish is manufactured by the Nugget Polish Co., of New York, 299 Broadway New York City, and imparts a high lustre

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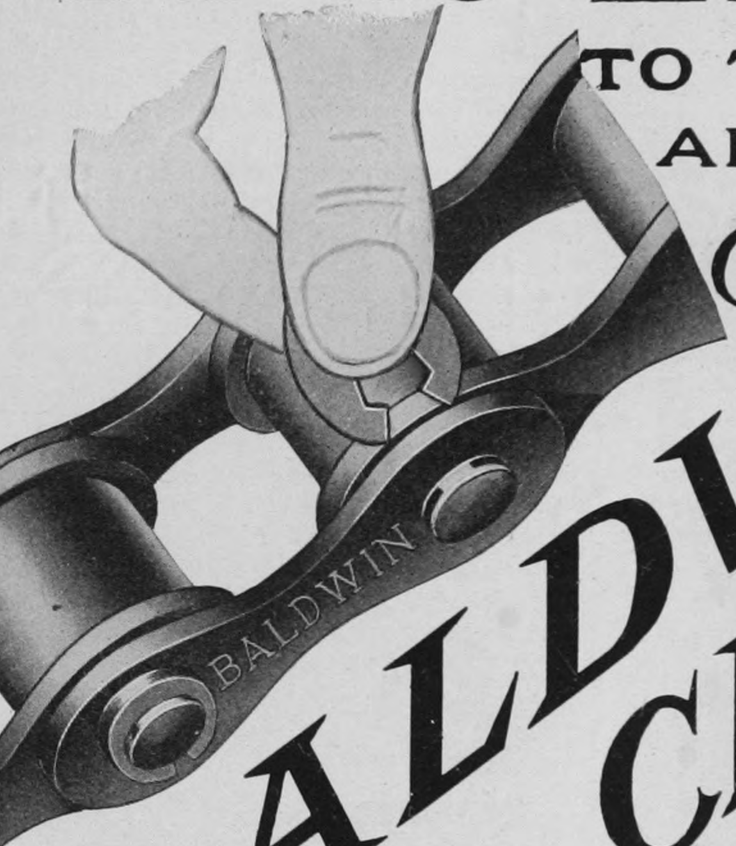
IT IS EASY

TO TAKE APART A



BALDWIN CHAIN

AND JUST AS EASY TO PUT IT TOGETHER AGAIN

Buy Baldwin chains and be in good company. The following are a few of our customers: Buick Motor Company, International Harvester Company, Brush Runabout Company, Schacht Mfg. Company, Zimmerman Mfg. Company, Mack Bros. Motor Car Company, Motor Car Equipment Company, Adams Express Company, etc.

In emergency a wire can be substituted for the washer. This type of detachable chain is as durable as a riveted chain. Suitable especially for trucks. The new detachable feature is gaining favor and meets the demands of the trade.

Baldwin Chain & Mfg. Co.

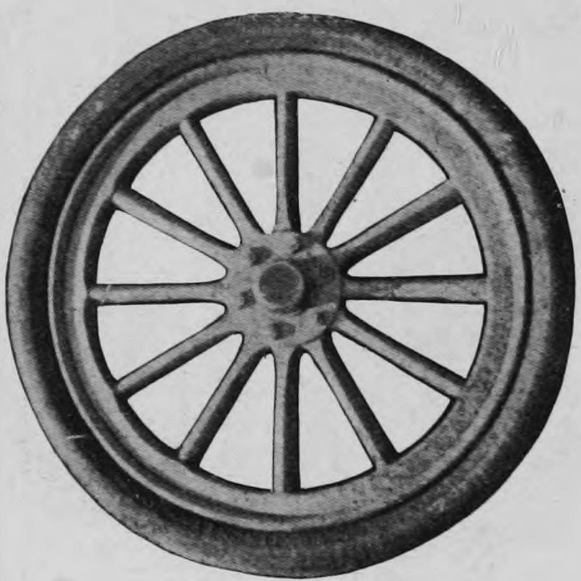
WORCESTER, MASS.

AGENTS: H. V. Greenwood, 166 Lake Street, Chicago, Ill.
C. J. Iven, Rochester, N. Y.

Google

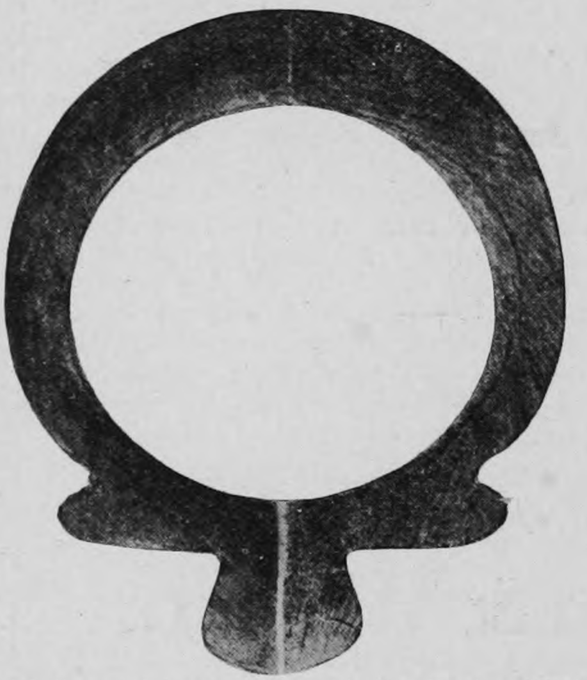
ection with same. This tire is manufac-ured by Walter Bowden, of 1619 Metro-oolitan avenue, Middle Village, Long sland.

The wheel is made in two parts, each oart comprising a hub section, spokes and elloe section. Each felloe section is pro-



The "Bowden" Wheel.

ided with a steel rim section, which en-ages one of the side flanges of the tire. n addition to the side flanges the tire is rovided with a central flange, is clamped ithin a recess formed between the two elloe sections. The two parts of the heel are bolted together through the fel-oe and hub.



pecial tire used in connection with the Bowden Wheel, although regular clinchers can be used.

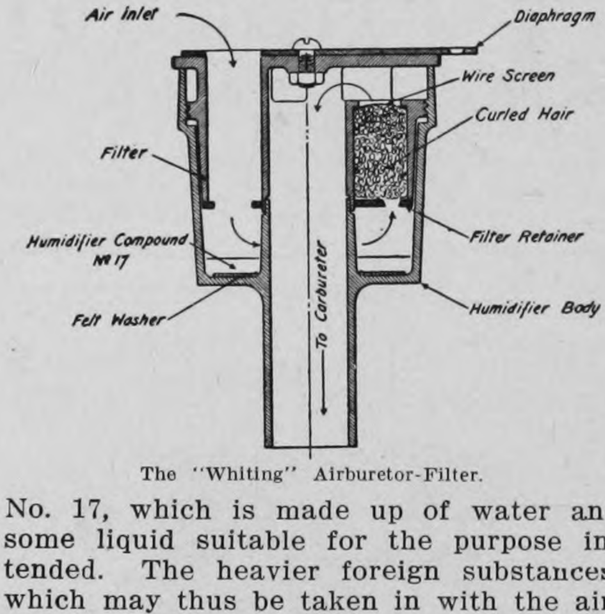
The most important feature of the in-

sure, but the side flanges of the tire ar also clamped by the metal rim sections These two clamping effects are secure whether the tire is inflated or not.

Another important feature of the invention is the ease and quickness with whicl a tire may be entirely removed and replaced. To do this the nuts are taken of and one-half of the wheel removed, whereupon the tire may be lifted out. It is replaced by the reverse operation. Othe good features of the wheel are the facility with which the ordinary type of demountable rim tires can be used in connectior with it. In this case the auxiliary rim is clamped between the metal rim sections o the wheel. By providing suitable holes spaced around the rim the ordinary clincher type of tire can be used in place of the special type illustrated. In some places it is desirable to introduce a ring of rubber or other material to fill up the central recess of the felloe.

THE WHITING AIRBURETOR-FILTER

The Whiting Airburetor-Filter is a small device made of brass or aluminum and is attached to the air intake on the carburetor of gasoline engines. It is manufactured by the Garlock Automobile Specialty Co., of Palmyra, N. Y. The air passing into the "filter" through the openings on top of the device, is directed downward towards the bottom of the device in which is placed a small quantity of compound



The "Whiting" Airburetor-Filter.

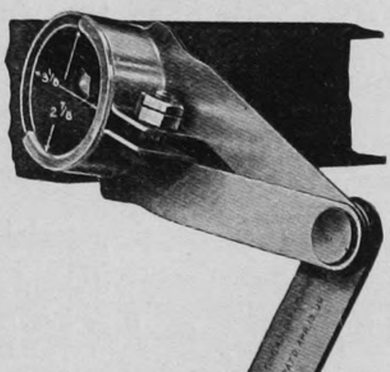
No. 17, which is made up of water and some liquid suitable for the purpose intended. The heavier foreign substances, which may thus be taken in with the air, drop into this liquid and are there held. The air and such of the dust and foreign matter as are not held by the liquid, pass upward through perforated brass or aluminum plates which form a chamber in which is placed asbestos fibre, steel wool ion of same and the retention of all for-ign matter by the filtering material con-ained within the chamber.

The air, now purified, passes on through he "filter" and into the carburetor where he mixture of air and gasoline takes place. 'he elimination of all foreign matter, it is laimed, gradually does away with the de-osit of carbon upon the spark plugs, and he wear upon the piston rings and the ylinders is greatly lessened, and the life f the engine greatly increased.

It is conceded by automobile users, who ave observed the difference that a car uns better and the engine seems more owerful on damp days or in the evening r night when there is more or less mois-ure in the air. These conditions seem be a direct result of the presence of this oisture. To produce the same result on hot dry day, the inventor of this device onceived that if a certain degree of mois-ure could be produced in the air which as taken in to form this mixture in the arburetor, greater power would result. y the use of the compound placed in the ottom of this receptacle and below the hamber, which contains the filtering fibre, certain amount of moisture is given off evaporation. This moisture takes the ace of and serves the same purpose as at naturally present in the air on a damp ay or in the evening or night time. The ter is simple in construction and is easily tached.

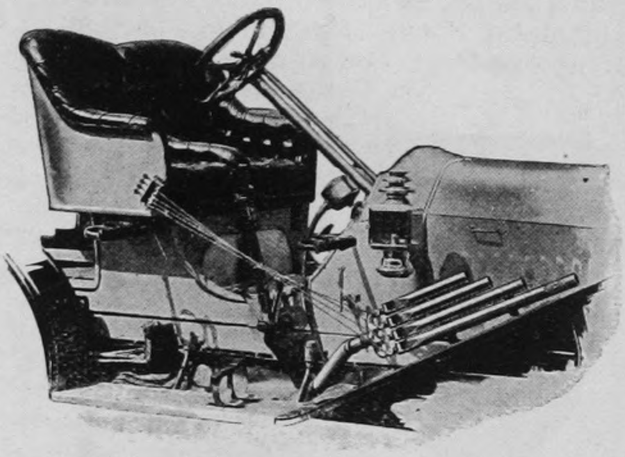
1910 GABRIEL PRODUCTS

The Gabriel Horn Manufacturing Co., 07 East Fortieth street, Cleveland, Ohio, ll continue to manufacture their No. 2, and 4 horns, and in the 1910 models the o lower notes will be operated together, aking a perfect chord, while the high te, which is two octaves higher than the ss chord, gives the effect of a soprano ice with a quartette. This change in mbination produces a singularly sweet usical effect and gives greater carrying wer than any signal they have yet built.



30 inches long, weight 4 pounds; No. 3 horn 3-inch tube, 32 inches long, weight 5½ pounds; No. 4 horn 3½-inch tube, 34 inches long, weight 6½ pounds.

The 1910 cut-out valve used in connection with Gabriel horns, is the same as the 1909 model, except that the lever is made from ⅜ inch materials and the screws which fasten the discs thereto are placed near the edge in such a manner that it practically forms one piece and greatly increases the strength of lever. The valves are made in sizes from ¾ to 3 inch for steel tubing and from 1 inch to 2 inch for iron pipe. This valve can be used for muffler cut-out purposes by removing the disc in main channel.



The Gabriel Trumpet Horn, showing the way it is attached to the car.

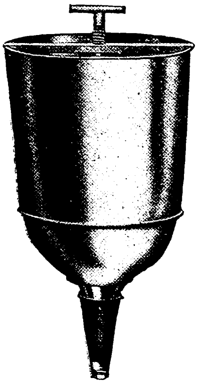
The Gabriel trumpet, illustrated herewith, is another novelty which this company has recently placed on the market and which has already become very popular. It consists of four single tubes with a small valve at the end of each tube which controls the tube individually. The trumpet is operated by a keyboard consisting of four keys, each controlling one of the notes. All combinations of trumpet and bugle calls can be played. The keyboard is also fitted with a small lever which opens the four valves at the same time, thereby producing a perfect chord for signal purposes, by simply pressing the foot pedal.

This company also manufactures a special ten tube horn with a full octave in the key of G with F sharp and A added. This horn is compact and easily attached to the car, consisting as it does of two tiers of five tubes each. It is operated by a keyboard similar to that of the Gabriel trumpet, except that with this ten tube horn melodies can be played.

The Foster Shock Absorber, shown in

only takes effect where it is rough enough to be actually needed. The stationary base of the absorber consists of an oval-shaped steel cup, the length being ¼ inch greater than the width. This cup is encircled by a one-piece band of flexible spring steel faced with a special prepared leather which bears against the outer surface of steel cup, thereby producing the required friction.

BROWN'S AUTOMATIC FUNNEL BUCKET



Browne's Automatic Funne Bucket.

The accompanying cut illustrates the funnel bucket manufactured by the Brown's Automatic Funnel Bucket Co., 3219-21 S. Figueroa street, Los Angeles, Cal. It con- the bottom of the funnel that is operated by the handle at the top. The bucket is carried by the Tee handle, and by placing the funnel sists of a novel device for filling gasoline tanks with gasoline without the unpleasant part of overflowing. It is automatic in its working; nothing to get out of order, is made of galvanized iron and holds 14 qts. It is a combination of a funnel and bucket. There is a valve at in the opening of the tank, and simply pressing down on the handle, the valve opens, and by turning the handle a quarter turn there is a locking device which holds the valve open and allows the gasoline to enter the tank, and when the gasoline reaches the bottom of the funnel it shuts off automatically.

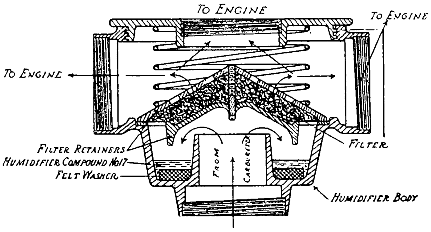
Before removing the funnel bucket the Tee handle is turned a quarter turn and the spring at the top closes the valve and holds the surplus in the bucket, which can then be carried and put back into the tank from which it was taken.

This funnel bucket will fit any round opening from 1¼ inches to 2¼ inches in diameter and is fully guaranteed to shut off automatically and thus prevent any overflowing providing there is no other opening in the top of the tank. The price of it is $3 delivered anywhere in the United States.

The Vanguard Manufacturing Co., of Joliet, Ill., have perfected a new bumper which will shortly be placed on the market. This concern also states that it will contest the injunction placed on it by the Turner Brass Company to show that it has not and is not now infringing on any patents whatsoever.

THE WHITING AIRBURETOR-MIXER

The Whiting Airburetor-Mixer is a small device of brass or aluminum and is installed in the air intake or manifold of a gasoline engine between the carburetor and cylinders. Complete, it consists of two patented elbow connections which enable one to get any angle from 45 deg. to 180 deg., any place in a circle. (These are to be connected to the end of the manifold); two aluminum bafflle plates; filtering material; one felt washer and a small quantity of Whiting Humidifier Compound, No. 17.



Sectional view of the "Whiting" Airburetor-Mixer.

The construction of the "mixer" is so arranged that the mixture of the gasoline and air in passing through it is thoroughly and evenly mixed so that one gets absolutely the same mixture in all of the cylinders, irrespective of the speed of the engine. It is claimed that this mixer produces snappier mixture and that the power of the engine is therefore greatly increased.

The Whiting Airburetor-Mixer, like the "filter" manifested, is easily attached, as the only necessary preparation is to cut the "Y" out of the intake manifold and put the "mixer" in its place. Its construction is simple as everything superfluous is done away with and being of bronze or aluminum (to match the manifold) all extra weight is eliminated and its strength increased. It is compact, being only 3⅞-in. in diameter and 3½-in. high. The device is the product of the Garlock Auto Specialty Co., Palmyra, N. Y.

SE-MENT-OL, TIRE-LAC AND THERMITE

The Northwestern Chemical Co., of Marietta, Ohio, manufacture a number of chemical products for automobile purposes.

Se-Ment-Ol is a compound made for the purpose of stopping leaks in automobile radiators, and will also keep cracked water jackets from causing trouble.

Tire-Lac is a chemical paint which when applied over rubber tires, closes the pores of the rubber, thus helping them to withstand moisture. Thermite is a new anti-freeze solution which is guaranteed to be absolutely harmless to metal or rubber.

"If It's Made by H-E-I-N-Z-E It's Right"

SPECIFY

Heinze New Magneto

ON YOUR 1910 CAR

and get the one that the best posted Ignition Experts have decided is superior to all others, whether of American or Foreign make.

SUPERIOR IN EFFICIENCY
SUPERIOR IN CONSTRUCTION
SUPERIOR IN OPERATION

Note This Important Feature!!!

Will produce perfect Ignition at 50 revolutions crank shaft speed.

The superiority of Heinze Coils made for us a reputation second to none in the Ignition field and with that reputation to sustain we offer you in the

New Heinze Magneto

absolutely the

MOST RELIABLE
MOST DURABLE
MOST EFFICIENT

Ignition Apparatus that it is possible to produce.

Whether you are the owner of one car or the manufacturer of ten thousand cars, you cannot afford not to investigate our claims.

We issue an elegant loose-leaf catalog which we will send upon request, if you will address DESK 10.

HEINZE ELECTRIC COMPANY

Factory and Main Office: LOWELL, MASS.

re sold by M. L. Snyder, 9 North Fourth treet, Philadelphia.

"Pyrene" fire extinguisher.

Pyrene is a fire extinguisher that is claimed will instantly put out burning benzine, gasoline, naphtha, calcium carbide and electrical fires. Any incipient fire of whatever nature not yet requiring the services of the Fire Department, is extinguished with ease and quickness.

The contents of this extinguisher, it is claimed, will not harm anything, from the color and texture of the most delicate fabric, or the polish and finish of the finest woodwork, to an electric motor, and will not leave the faintest suspicion of a mark or stain. Pyrene will not freeze up to 60 degrees below zero and never deteriorates. It weighs 4 pounds complete and never needs echarging until it is fully discharged.

The Imperial Non-Explosive cans are made in conformity with the Underwriters' laboratories' specifications, fitted with he Imperial Device. They are made from 24 to 26 gauge galvanized steel bodies, cold-rolled steel No. 22 cone tops and botoms, spouts lugged and riveted to cone op, the cone top riveted to body of can, hen soldered inside; and the bottom riveted and soldered, making an indestructble steel can. Cans so made and fitted with the Imperial Device on the spout, are laimed to be scientifically correct and non-explosive, although filled with the most xplosive fluids, subject to heat or flame.

UNDERWRITERS
LABORATORIES INC.
INSPECTED SAFETY CANS96
IMPERIAL
NON-EXPLOSIVE
-PATENTED-
UNIVERSAL SAFETY
TANK & CAN CO.
CHICAGO, ILL. U.S.A.

"Imperial" non-explosive can.

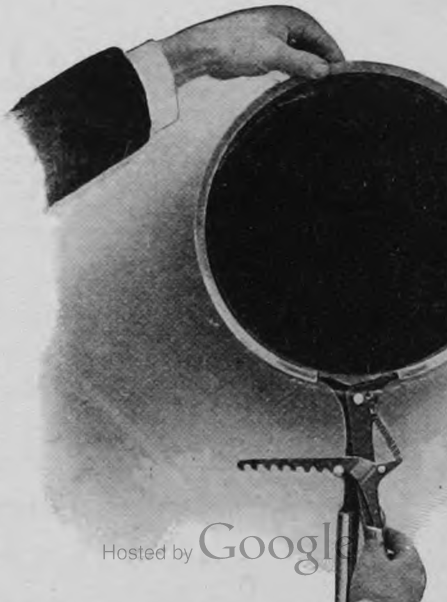
saves from 33 to 50 per cent. in evaporation and waste.

The prices of Imperial Cans are from $1.50 for the pint size to $10 for the tengallon size.

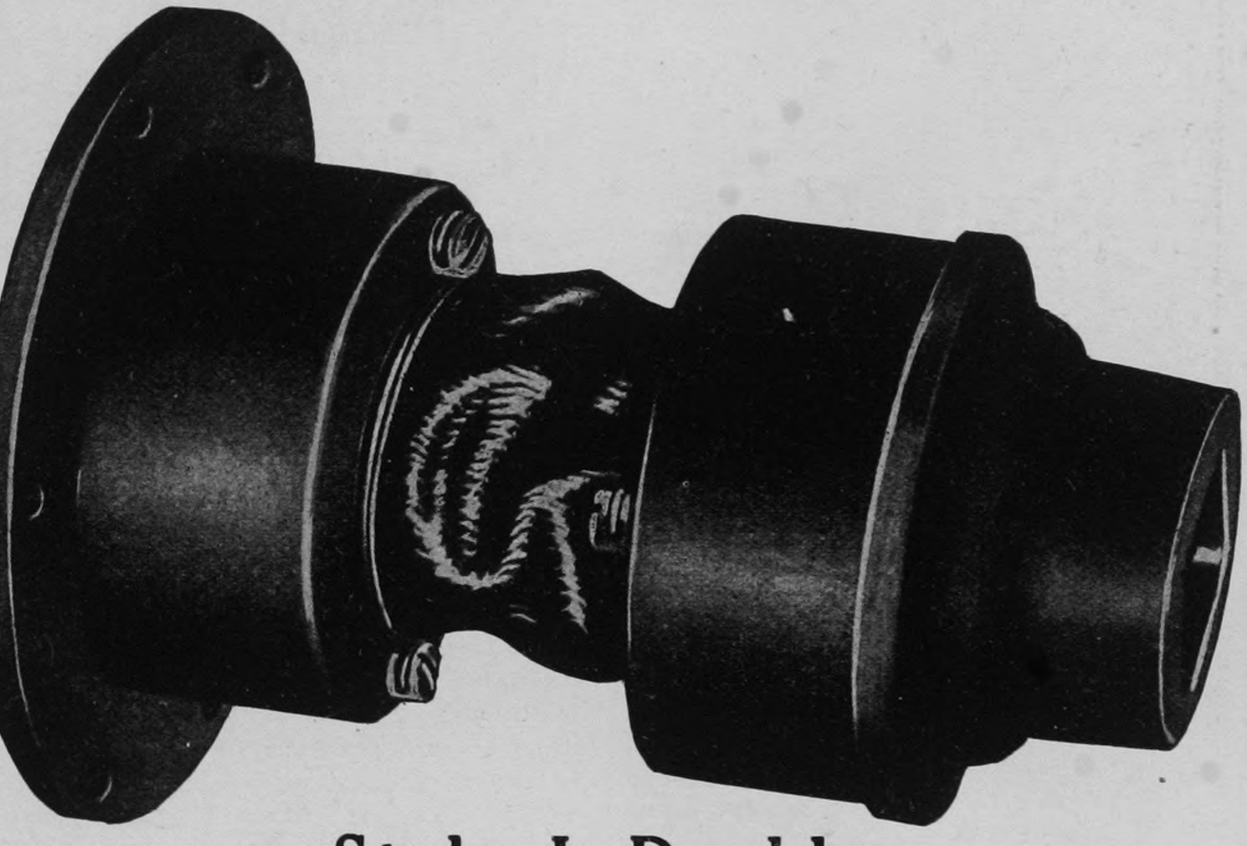
THE "ECONOMIC" PISTON RING EXPANDER

By means of this device piston rings can be placed on the piston and removed in about 10 seconds and without fear of injuring the rings. The expander works equally well with any form of cut, whether diagonal, square, lap, tongue, or drilled and split.

On large bevel cut rings on account of the great strain it is necessary to drill a very small hole in the ends of the ring but on small bevel rings up to 7 inches in



BLOOD BROS.
UNIVERSAL JOINTS



Style J, Double

¶ Adapted for use between engine and transmission. We have many other patterns, both single and double.

Blood Bros. Machine Co.

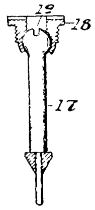
Kalamazoo, Michigan

diameter a center punch mark is sufficient. The points of the jaws are case-hardened and all parts are made of first quality cold rolled steel nickel-plated. The device is made by the Economic Tool Co., of Lorain, Ohio, and lists at $2.

THE WACKENHUTH NON-SPRAYING CARBURETOR.

The carburetor, illustrated herewith, is manufactured by the Wackenhuth Carburetor Co., 26 Hackett street, Newark, N. J. It was described and illustrated in the July issue of this journal, on page 122, but since that description was given we have secured better drawings and a more detailed description.

Fig 3



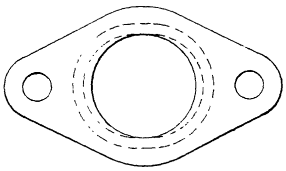
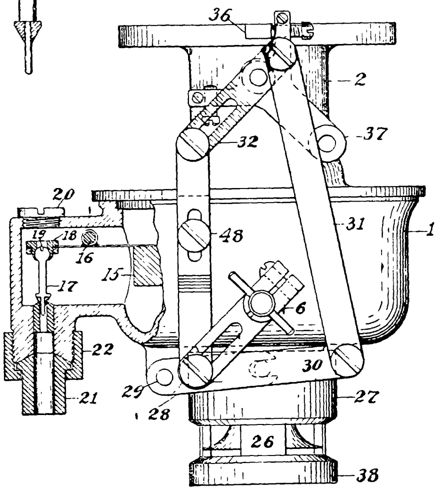


Fig 1

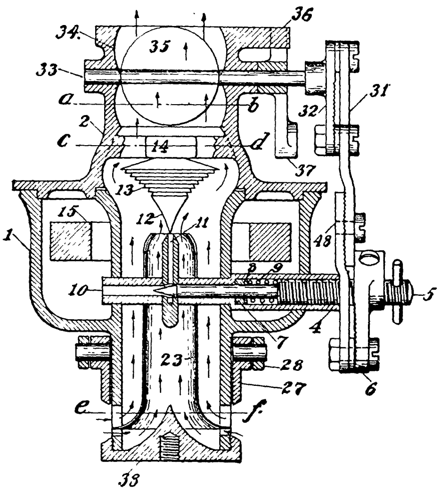


The Wackenhuth non-spraying carburetor showing the arrangement of the external parts.

The gasoline outlet or nozzle 11, is on the point of the cone 12, onto which it is spread by the passing air current, by which it is absorbed before it reaches the top of the cone. The mixture formed is uniform, on account of the cone spreading the gasoline into a thin film of large surface, and the air in its passage by the cone is also spread to a larger diameter, and in so doing, causes the air to absorb the gasoline, and form a uniform mixture. The ratio of gasoline and air is maintained by connecting the throttle 35, needle valve 5, and air inlet port sleeve 27 in an adjustable lever link combination 28, 29, 30, 31, 32, 48 and 6, which gives a perfect mixture at all speeds and load of engine. The opening of throttle also opens the needle valve and air inlet ports.

The adjustment for correct mixture is made by running the engine at slow speed with a low throttle, and noting position of needle valve 5 for correct mixture, and then running the engine at open throttle, maximum speed and power, and noting position of needle valve for correct mixture; then adjusting the lever link combination, so that the needle valve is at the correct position at high and low speeds with movement at throttle.

Fig 4.



Sectional view of the Wackenhuth carburetor.

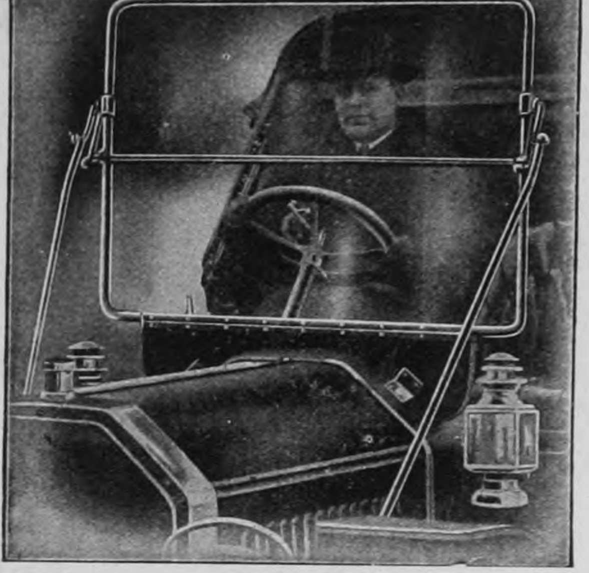
The mixture of gasoline and air depends on the absorption power of air for gasoline at a given temperature; it does not depend on any spraying process.

It is claimed this carburetor prevents backfiring, due to poor mixture, in the crankcase of two-cycle engines. On two port two-cycle engines a check valve is required between the carburetor and crankcase inlet. The price for the 1¼-inch pipe size is $18.00.

THE WOODWORTH TREADS FOR 1910

The Leather Tire Goods Co., Niagara Falls, N. Y., have just brought out a new style of tire for 1910 called the Woodworth Improved Self-Adjusting Tread.

The method of holding this tread on the tire differs considerably from that of the well-known Woodworth Adjustable Tread. It consists of a number of galvanized steel plates riveted along each side of the tread a short distance apart, connected by short and very stiff springs. Each spring is



Patent Pending

These Are the Days

when you appreciate a windshield. If you want one that combines comfort and protection with beauty, you will get the

"ACKERMAN"

The Absolutely Automatic Windshield

The frame is of solid brass. The best plate glass is used and it is absolutely rigid up or down. This is often **claimed**, but in the ACKERMAN it is a **fact.**

DEALERS—you certainly will want to handle the ACKERMAN when you get our proposition and prices. Write to-day.

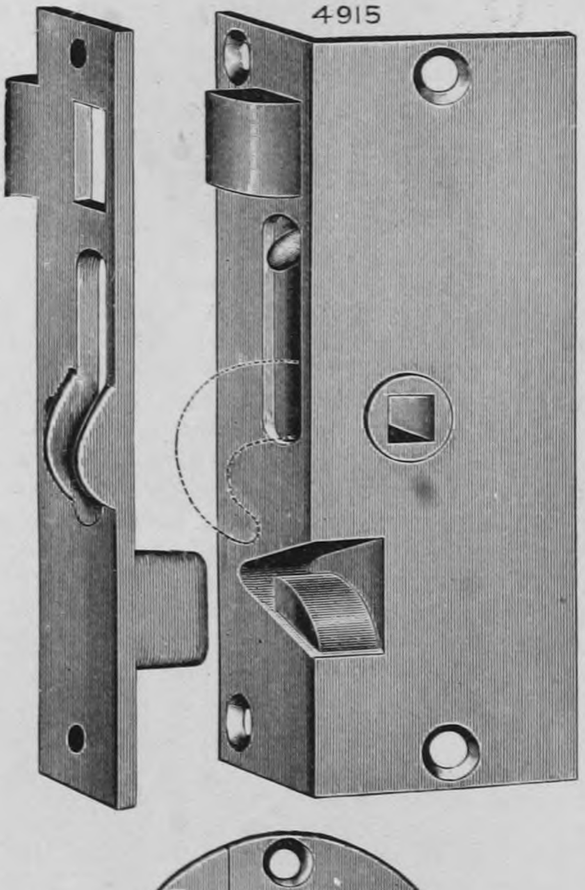
AUTOMOBILE MOUNTINGS

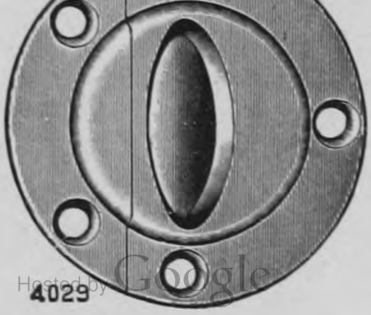
All the latest "kinks" and trimmings that add so much to the appearance of your automobiles are manufactured by us. Get a copy of our catalog, which pictures many useful, and at the same time ornamental articles, such as the following:

- Malleable Coach Hinges
- Brass Coach Hinges
- Lamp Brackets
- Foot Rests (Folding)
- Hood Handles
- Curtain Fasteners
- Footman Loops
- Tire Holders
- Strap Loops
- Body or Grab Handles
- Side Door Handles
- Dash Moldings
- Running Board Moldings
- Carpet Binding
- Bow Separators
- Bow Rests
- Hood Hinges
- Deck Rails
- Continuous Hinges
- Side Door Locks
- Automatic Hook Locks
- Finishing Bolts
- Wind Shields (Ackerman)
- Finishing Screws
- Washers and many other useful articles.

Other makers are using them, and we know you will be equally as well satisfied. Send specifications and let us estimate.

4915





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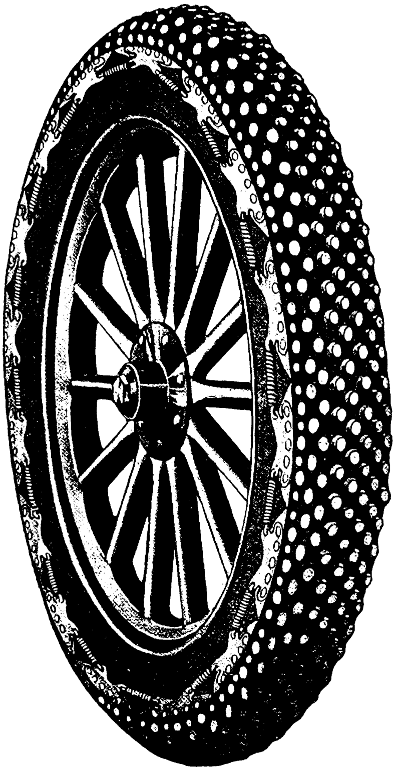


The New Woodworth Tread.

linked to one end of a plate, and has a hook on the other end. The tread is applied by slipping it sidewise over the deflated tire with the springs unhooked. After the tread is in place the springs are hooked connecting the plates and forming a ring on each side. As the tire fills out the springs are stretched, holding the cover tight on the tire, and always ready to take up any slack.

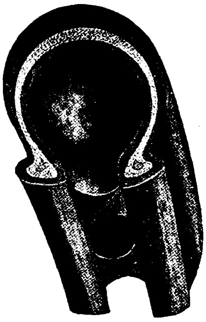
Besides the new adjustment, the Improved Self-Adjusting Treads have the leather treated by a new process, which the makers state they found by experience doubles the life of the leather, preventing the action of dirt and water from affecting it. The new leather is of a very dark green color.

The rivets used in the middle of the protector have thicker heads than have been used in other treads, adding greatly to the mileage. They have the corners rounded off so that they cannot be caught in such a way as to be forced out of the leather. The leather on each side of the heavy rivet is studded with flat head rivets which do not materially increase the weight, but protect the leather in ruts or on rocky or stony roads.

H. W. Doherty, for the last two years sales manager of the Cameron Car Company, Beverly, Mass., resigned his position with that concern on November 1.

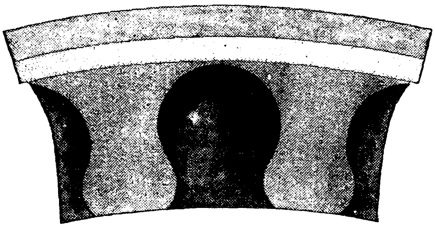
NEW "NATIONAL" AIRLESS TIRE

The Airless Tire Company of Indianapolis, Ind., has placed a new airless tire on the market of which two views are given herewith. The construction is probably the simplest of any of the propositions that have been involved in the effort to get away from the trouble and expense incident to the pneumatic tire.



The "National" airless tire.

The whole tire is one homogeneous mass cured together. The outer part is precisely the same as the ordinary clincher tire, made up with layers of fabric and rubber and outer tread. That portion usually occupied by the inner tube is a series of piers and spherical cavities. This construction gives to the piers the truss principle of strength in every direction. These piers do not come clear to the rim of the wheel but stop just even with the top of the clincher. That gives them a play when under pressure and at the same time gives a continuous air passage that prevents undue heating. The spherical shape of the cavities gets entirely away from any corners and angles that would cause wear and tear at speed. The tire is made to fit any standard clincher rim.



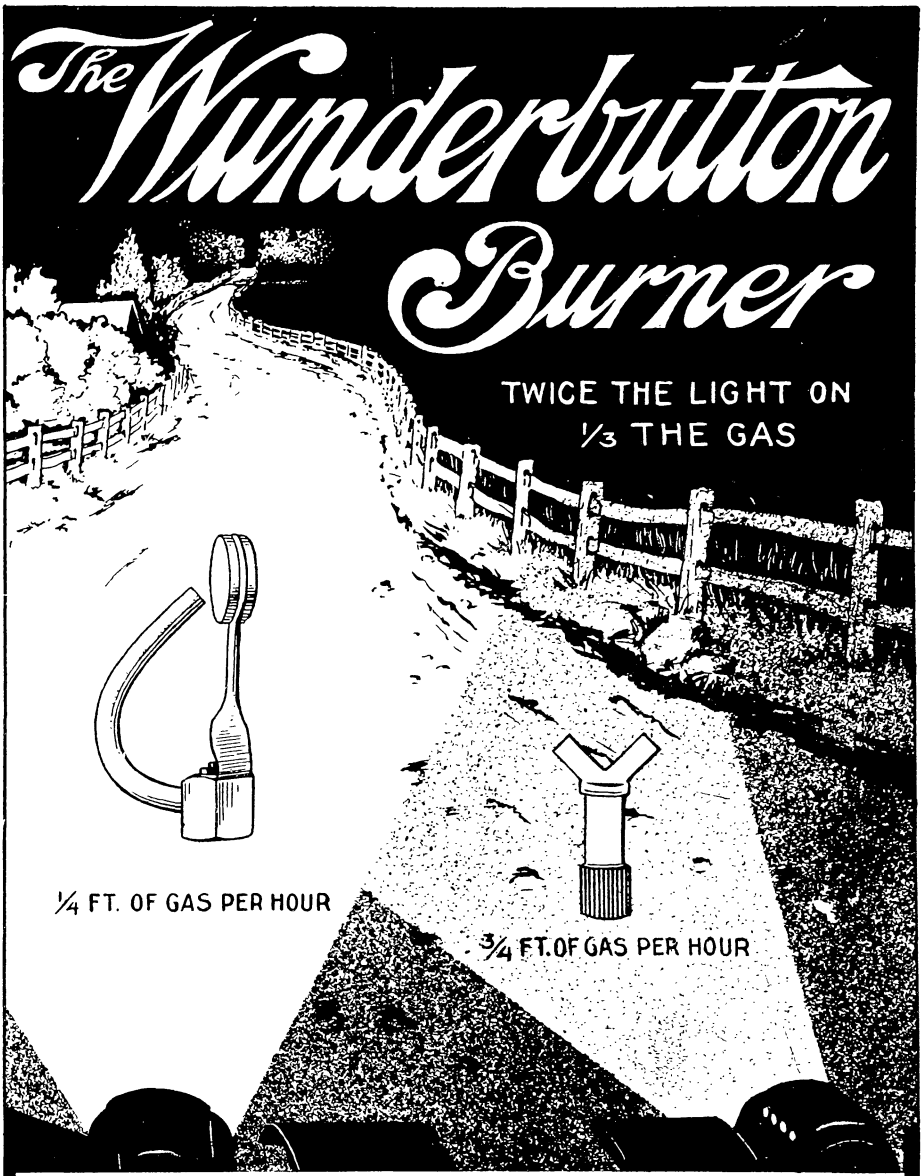
Sectional view of the "National" airless tire.

THE AUTO TIRE RE-ENFORCEMENT.

The auto tire Re-Enforcement, shown herewith, is manufactured by the Auto Tire Re-Enforcement Co., of Auburn, Indiana.

This re-enforcement is designed to be placed between the inner tube and the shoe of a tire to re-enforce it. It is constructed of three or four plies of fabric heavily frictioned with the best rubber, vulcanized and shaped to fit the inside of the tire. Being covered with a special vulcanizing rubber on the surface, coming in contact with the casing it adheres and becomes an integral part of the casing; and the inside being thoroughly coated with a specially prepared tire paint such as tire makers use in new tires, there can be no friction.

The Wunderbutton Burner


TWICE THE LIGHT ON
⅓ THE GAS
¼ FT. OF GAS PER HOUR
¾ FT. OF GAS PER HOUR

WUNDERBUTTON BURNER ←	(THE LIGHT FROM)	→ OLD STYLE BURNER

¶ Makes any old lamp a real headlight. Simply unscrew old burner and screw on the new one. No other change necessary. Increase your light, and saving in gas will pay for burner in couple of months. ¶ Write today for the Wunderbutton Primer. It gives a lot of light on the light subject.

WUNDERBUTTON MFG. COMPANY
242-244 Lafayette Street, New York

READY FOR USE
ROLLED UP

The Auto Tire Re-enforcement.

It is claimed this Re-Enforcement increases the life of a tire by from 50 to 75 per cent., as it allows the tire to be used until it is worn down to the fabric. The prices range from $5.50 for the three-ply 28x3 to $11.00 for the 36x5 with an extra charge of $1.25, $1.75 and $2.25 for an extra ply in the 4, 4½ and 5-inch sizes respectively.

The Auto Tire Re-Enforcement Company also makes five sizes of blow-out patches. These are made up of the same material as the complete re-enforcements and have one ply wide enough to clinch around the bead of the tire on either side. They stay where placed and prevent spreading of the blowout.

The prices are: For 3-inch tires (8 in. long), $0.60; for 3½-inch tires (9 in. long), $0.75; for 4-inch tires (10 in. long), $0.90; for 4½-inch tires (12 in. long), $1.00, and for 5-inch tires (12 in. long), $1.25.

U. S. INDESTRUCTIBLE ELASTIC METAL GASKETS

The U. S. Indestructible Gasket Co., 50 Church street, New York, N. Y., manufacture all kinds of metallic gaskets. They are made in all sizes, shapes and thicknesses, in copper, lead, steel, bronze, Ames Alloy, Indestructibleite, Norway and Swedish Iron, etc.

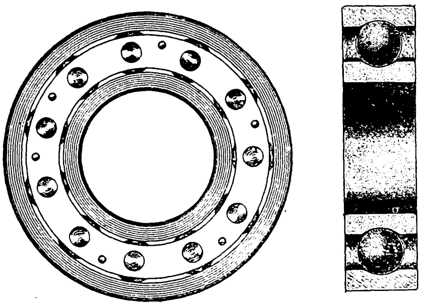
The metallic gasket may be used in place of rubber or other destructible materials in general use for packing and consists of sheet metal, stamped with concentric corrugations. Connections made with these gaskets will not blow out after continued use, for each corrugation makes the entire circle of the flange, and so long as the contact is kept complete by compression the joint cannot leak.

This company also makes washers in all sizes, shapes and thicknesses of any metal, also of fibre, leather, asbestos, rawhide, mica, cork, felt, canvas, paper, etc.

"RHINELAND" BALL BEARINGS

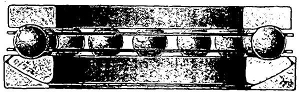
The accompanying cuts show two types of ball bearings manufactured by the Rhineland Machine Works Co., of Dusseldorf, Germany, and handled in this country by Sultemeyer & Co., 50 Church street, New York City.

The radial bearing here shown consists of two ball races, a number of balls and a standard type ball retainer, and is made in three series for different loads.



"Rhineland" Radial Ball Bearings.

The thrust bearings consist of two grooved rings, a series of balls and a ball retainer, the lower ring being ball shaped so as to distribute the load equally on all balls. The thrust bearing illustrated is fitted with a soft steel adapter plate fitted on the lower ring. This type is a very popular form, as it saves the expense of cutting the ball shaped seats. The retainer used is practically the same form on the thrust as on the radial bearing, and has undergone no change since first adapted.



"Rhineland" Thrust Ball Bearings, with adapter plate.

It is said that many of the principal European automobile manufacturers have been using this make of ball bearing on their cars, and no trouble has been caused by the balls and the ball races cracking.

"AQUILA" LUSTRE.

"Aquila" auto body lustre and leather dressing is manufactured by the Aquila Chemical Co., 187 3rd Street, Milwaukee, Wis. It is a polish for use on automobile bodies or polished wood of any kind and leather upholstering, tops, etc. It is claimed that this polish preserves the leather, keeps all the enamel parts clean and always retains its brilliancy. It keeps the leather soft and pliable and on enameled wood work does not show finger marks nor assume a smoky appearance. "Aquila" lustre is sold by dealers for $1.50 per bottle.

HESS
BRIGHT
BEARINGS

PUNCTUALITY in SUPPLY

of the materials that the automobile builder buys is so vital a factor that its failure will defeat the most perfect car building and selling organization.

HESS-BRIGHT is SYNONYMOUS with PUNCTUALITY

It is true that HESS-BRIGHT BALL BEARINGS are not the lowest priced—the best article in its line never is –but what becomes of the purchasing department's laudable economy of a few dollars per car when that car is held up?

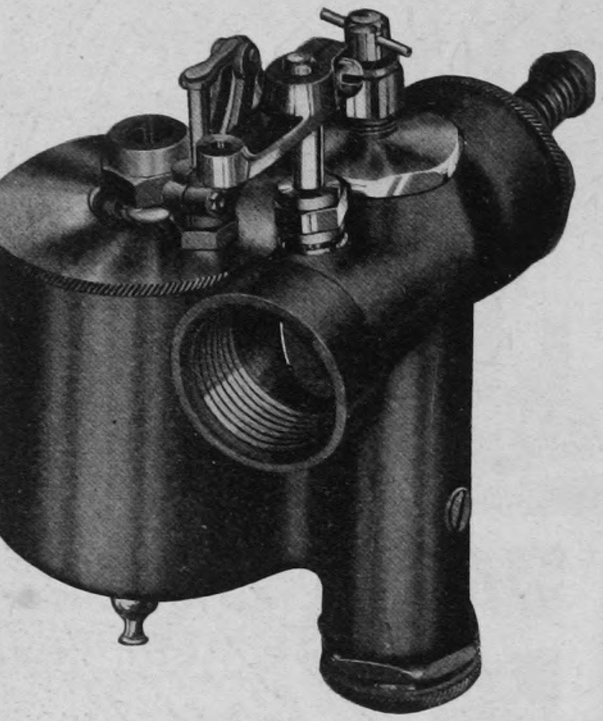
ENSURE CAR OUTPUT ON TIME by RELIANCE ON HESS-BRIGHT

Verify this by inquiry of our customers—they are not difficult to find—then send us your specifications.

THE HESS-BRIGHT MFG. CO., 2102 FAIRMOUNT AVE., PHILADELPHIA, PENNA.
NEW YORK BRANCH STORE :: :: :: 1974 BROADWAY

ongress streets, Chicago, Ill.

It is made of red brass for 1 and 1¼ ch pipe size. The float acts direct, with- ıt levers and makes the valve tight re- ardless of the angle of the car or carbu- etor. The ball and socket point make a ill more positive seating.



The "Kelly" carburetor.

Quite a margin is left below the outlet pening in the float chamber for water or diment and prevents the car from stop- ng at a critical time.

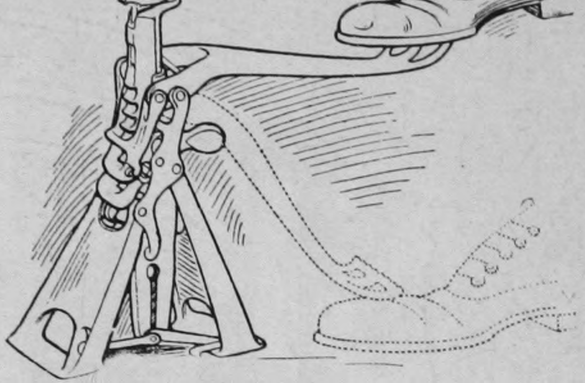
The priming and low speed air cup are justable and the needle valve acts as a reader. There is an auxiliary air valve d independent adjustment of spring ten- on and stroke of valve.

The primer is adjustable so as to oper- e from any point as is also the butterfly rottle valve. All screws on this carbure- r are double locked.

THE "SPITZLI" AUTOMOBILE JACK

The "Spitzli" auto jack, a cut of which shown herewith, is manufactured by the itzli Manufacturing Co., of Utica, N. Y.

The feature of the "Spitzli" jack is that is operated by foot power eliminating necessity of stooping over, except en placing or removing the jack. After e jack is placed it is operated by press- g down with the foot and then raising e weight of the lever by means of the e, as shown by dotted lines in the illus- tion.



The "Spitzli" Automobile Jack.

rising it is raised still further by means of the toe which adjusts it for another operation.

This jack, when folded, is so compact that it fits nicely into one end of the average tool box. It is ready for use instantly. There are five different sizes, the largest of which occupies a space only 10½x3½x 3½ inches.

Another feature of the "Spitzli" jack is the extension ladder by which the lifting height can be increased or decreased. When placed in position it is absolutely rigid. Like all other parts of the "Spitzli" jack, the extension ladder is made of the toughest malleable iron, fully tested before it leaves the factory. The size of the extension jack is 11½x3x3.

A 10x6½x5 non-folding jack for garage use is also made. The "Spitzli" jacks weigh from 4½ to 7 pounds apiece, according to size, and list at from $1.50 to $4.00 for an alumnium bronze, baked Japan or gun metal finish.

"FROST" AUTO GEARS AND TRANSMISSIONS

The Frost Gear & Machine Company, of Jackson, Mich., have enjoyed an especially rapid growth during the past two years, and have recently moved their business into a new plant in the eastern part of the city. A large amount of new equipment has been installed, including several generators, grinders, lathes, etc. They have also installed a very complete hardening plant, with furnaces and sand blasting outfit, and are now turning out rear axle and transmission gears for many of the largest automobile concerns in the country. They also do considerable contract work upon machine and engine parts, besides building complete transmissions to specification. Their entire product is marketed through the American Distributing Company, of Jackson, Mich.

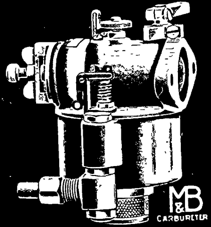
The Lunkenheimer Co., of Cincinnati, Ohio, informs us that the motor boat "Red

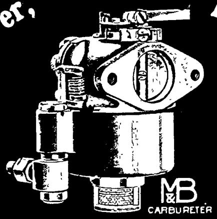
Google

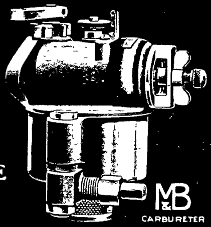
Mosler Spit Fire Lead the World

The Plug with the Deepest Chamber.

Power, Speed, Economy







ARTHUR R. MOSLER
Mech., Elec. & Auto Engineer

GEO. A. BREEZE
Designer

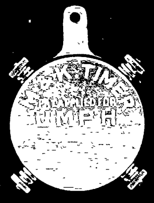
An instrument of extremely high efficiency. Small, light, neat self-contained. Substantial, simple to adjust.

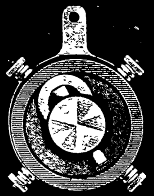
M&B

Results of nine years' experience. Perfect fuel strainer. Flooding and Back Firing impossible.

Carbureter

"It's So Simple"





Umph Timer

Double ball bearing.
Self-adjusting
Self-centering clutch.

Made to fit any shaft any engine.

No friction, no wear
Wobble impossible.

A. R. MOSLER & CO. 163 W 29TH ST. NEW YORK.

ustrated herewith. As the name implies t vulcanizes a new tread to the tire, nd thereby makes it possible to get four imes the ordinary service out of the tire.

Special attention is called to the easy nanner in which tire cuts can be repaired y means of Vulco-Nu-Tread. The cuts re simply scraped clean of all dirt by a lunt knife and the jagged edges of the ut cut away, leaving the cut smooth. The ut is then washed with gasoline and alowed to dry thoroughly. The cut is now illed up with the mastic that is furnished vith the outfit, and which vulcanizes itself old in the fabric and rubber and forms tself part of the tire.

VULCO-NU-TREAD
THE COLD VULCANIZING PROCESS
NU-TREAD FOR AUTO TIRES
FOR FILLING CUTS IN CASES
HAZEN-BROWN CO.
BOSTON, MASS., U. S. A.
THE PERFECT
VULCANOID
VULCANIZING FLUID

The "Vulco-Nu-Tread" vulcanizing outfit.

NEW FOLDING WIND SHIELD

The Banker Wind Shield Company, Baum and Beatty Streets, Pittsburg, Pa., as recently placed on the market a new nodel, known as the No. 5 angular shield.

This shield is especially constructed for unabouts, roadsters, phaetons, etc., and s of the double folding type. The ower half is anchored rigidly to he dash and brought back toward the river at an angle of 60 degrees at which oint it folds up in a vertical position ufficiently near the driver to give him mple protection in all kinds of weather.

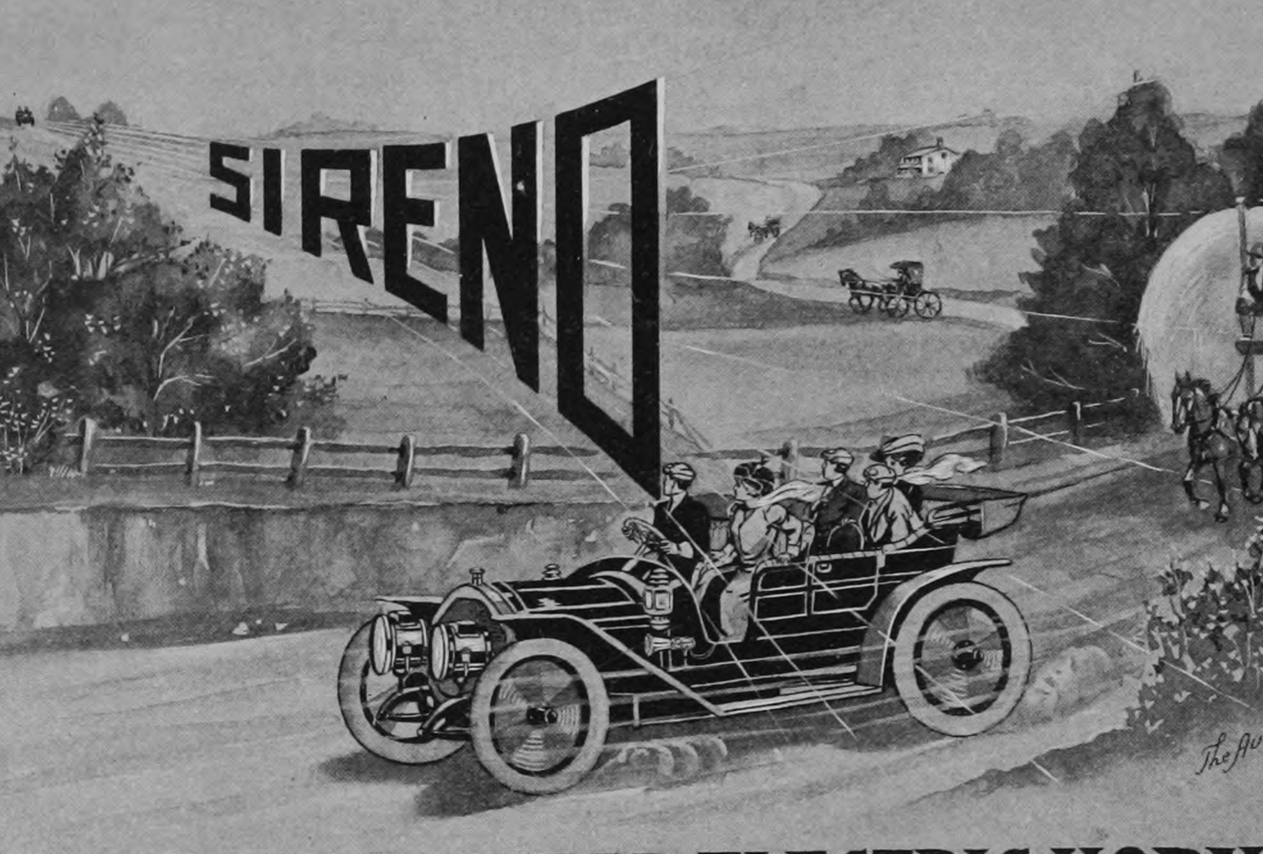
NEW VALVE GRINDING COMPOUND

A new substance recently put upon the narket with the idea of saving motorsts labor, material and money in valve rinding, is being manufactured by the Vicor Auto Supply Mfg. Co., 42 West 43rd

being an expensive process, it has been found by experts to be highly injurious in many cases. Vasco Grindine has been prepared to eleminate the dangers of emery and machinists who have tried it find that it does so most efficiently. The abrasive in the compound is an electrochemical product and was selected over all others owing to its extreme hardness, sharpness and temper. The binder used has a high viscosity and produces a smooth, even surface. Conveniently put up in collapsible tubes, both coarse and fine, the preparation always remains at the right consistency. One of the chief virtues is that it does not waste away or drop into the cylinder during the process of grinding. It also cuts very rapidly.

THE CAMPBELL CRANK BOOT

The Campbell crank boot, illustrated herewith, is manufactured by the Perkins-Campbell Co., of Cincinnati, Ohio. It is made of harness leather in one piece, being shaped in a press, a leather plug then being driven down in the bottom, thereby making the boot hold its shape, no matter what strain or use it is put to. The strap, which is ¾ inch, goes completely around the boat, making it strong. It is impossible to break the end out of this boot or make it lose its shape in rain or mud. It is to be standard equipment for 1910 on several of the well



THE MILE-AHEAD ELECTRIC HORN

The Awakening of the Motoring Public

Gradually, but with irresistible force, the *importance* of the Long Distance Signal Horn is being borne in on the minds of the motoring public. If your own observations have not confirmed this statement, let *us* give you some facts to substantiate the assertion:

In the last twelve months the demand for the SirenO Electric Horn has developed so rapidly that the Company's output has increased *four times* over that of the preceding year! From all indications the year 1910 will see even greater progress!

The day is not far distant when every auto owner will see the necessity of including in his regular equipment a powerful warning signal. Public safety demands it, just as it demands strong brakes or reliable headlights! Your own pleasure depends upon it!

The SirenO is the motorist's safety valve—his searchlight of sound! Its intense penetrating note compels attention.

The automobile owner of to-day has need for an electric horn—one that is operated from his ignition battery. He has neither time nor patience to bother with ancient, discarded types, or the weak, thin-voiced variety of warning signal.

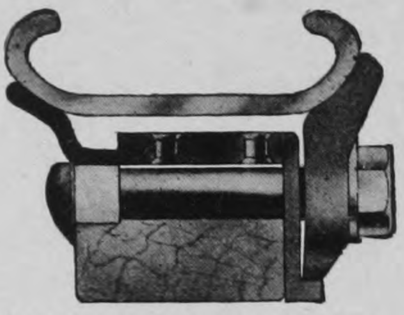
The SirenO—the "Press-the-button" type—the horn that responds instantly with an unmistakable note of warning, is the only one that will fulfill his every requirement and assure his safety and comfort, and that of countless others.

The SirenO is made in six styles and sizes, varying in price from $25.00 to $38.00. They may be seen at your dealer's, or we will send you full particulars upon request.

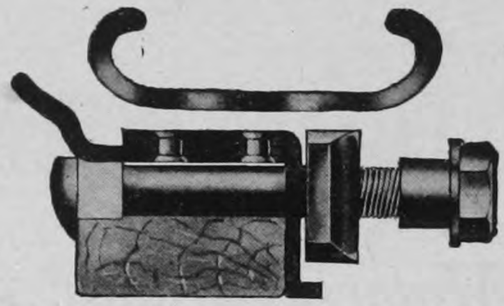
The SIRENO Company

1100 Taylor Building
New York

rtion and without getting one's hands nd clothing hopelessly soiled, is to take rom motoring its greatest drawback. To his end the Empire Tire Co., Trenton, N. J., have produced a new removable rim of which there are two views given herewith.


he new "Empire" removable rim bolted in place on wheel.

The Empire removable rim is claimed to be so simple and easy to operate that no one can make a mistake or handle it improperly. One view shows the rim bolted n its place on the wheel. Each wheel has eight bolts; but six of them should be oosened to make a change, the bolts on either side of the valve being left at all imes screwed up tightly.


"Empire" removable rim with nuts loosened lug turned side and rim partially removed.

The nuts used have collars, threaded on he inner sides, which makes it unnecessary to remove them from the ends of the bolts. Five turns of the wrench loosens he nuts sufficiently to permit the lugs to urn sideways, so that the rim may be removed.

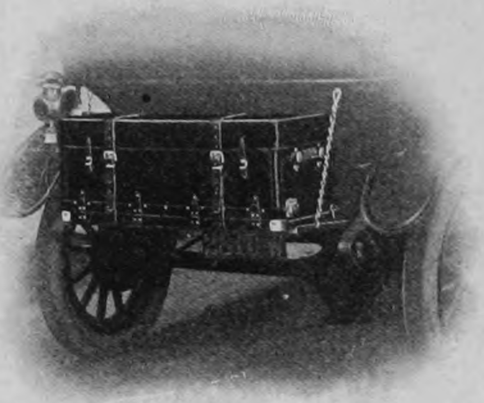
The second illustration shows the nut oosened, lug turned aside, and rim partially freed.

The prices for a complete set of 4 inner im bands, 6 clincher rims, 32 lugs, 32 bolts, 1 brace wrench, are, 3½ inch, $48.00; inch, $52.00; and 4½ and 5 inch, $56.00.

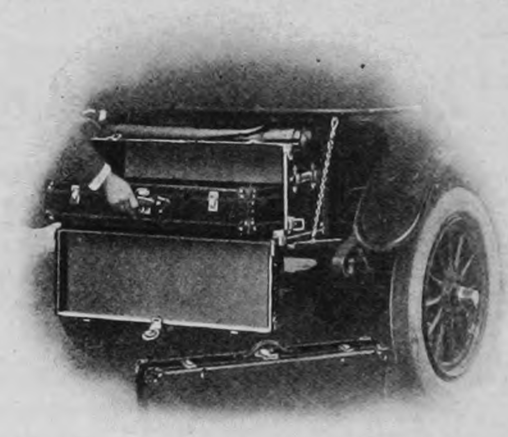
Howard Case & Co., of Lethbridge, Alberta, announce that they have sold out certain branches of their business to devote their entire time and interests to the automobile trade and are prepared to consider district or provincial agencies for

durable, dust and waterproof trunk for use on touring cars.

The material used in the construction of the box or trunk proper is three-ply basswood veneer. The covering is of heavy enameled duck, to which the dust cannot cling. The trimmings are of the best steel. The trunk is thoroughly fastened and riveted throughout, and lined with a heavy grade of Holland linen.


The "Kamlee" Auto Trunk.

The interior arrangement of the trunk deserves special attention. The suit cases are made to fit and fill the box and are covered with the same dust-shedding material as the box. They are carefully fitted to shut tight, strengthened with steel frames, lined with Holland linen, trimmed with high quality locks and bolts and equipped with solid leather handles. The trunk opens at the back downward and outward, as shown by the accompanying illustration, thus allowing the suit cases to be removed without detaching the trunk itself from the car, and the contents of each suit case may be got at without interfering with the others. An extra covering of enameled duck is provided as an added protection against heavy driving rain or


The "Kamlee" Auto Trunk; showing how suit cases can be removed without detaching trunk.

A 1911 Improvement on Your 1910 Car

FIRESTONE DEMOUNTABLE RIMS possess improved features that put them **just one year ahead** of all other devices for quick and easy tire changing. You can get them on your new car if you **firmly insist.**

A year from now the exclusive Firestone features will be extensively imitated. Get these Rims **now,** and have one whole year's benefit from the real article, plus the satisfaction of knowing that yours is the most up-to-date tire equipment the automobile world can offer.

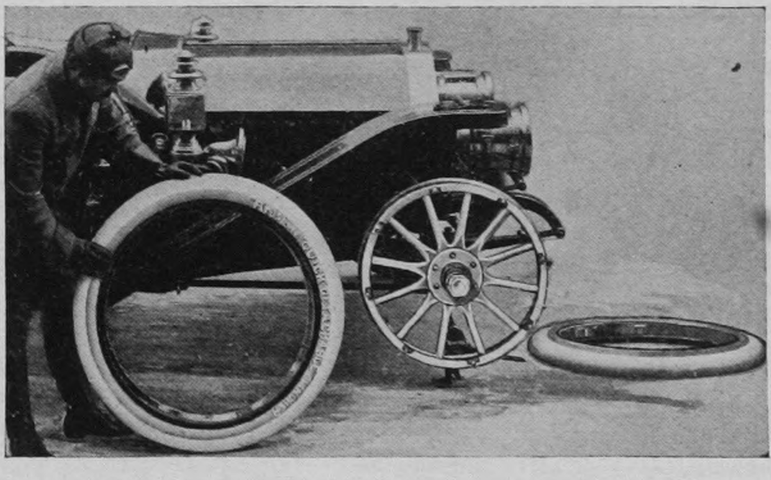
THE pleasure you derive from your car will be multiplied if you use **FIRESTONE Demountable Rims.**

They **completely abolish** the annoying exertion, vexatious delays, etc., etc., incidental to tire mishap. Your tire-change is made **without even pumping up;** you merely unlock the damaged tire and its rim and slip on a spare rim with tire already inflated.

One of the exclusive Firestone features does away with the stay-bolt nuisance common to demountable rims for clinchers only which **we discarded** in view of the **superior advantages** of this quick-detachable Demountable Rim.

"Firestone"
Demountable Rims

(For all quick-detachable and clincher tires)



ANOTHE
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Fireston
feature permit
of **any desire**
number of tir
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same trip. N
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will still find i
practicable t
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may be.

Tire changes ar
made so easil
with **Fireston**
Demountabl
Rims that yo
are not tempte
to run your tir
flat and ruin i
One complet
tire so destroye
would about pa
for equippin
your car wit
FIRESTONE D
mountable Rim

Your old tires, if standard quick-detachable or clincher, may be retained in use, as the **Firestone Demountable Rim** will take any type.

Progressive car manufacturers will furnis
Firestone Demountable Rims if specified, bu
naturally prefer to supply only such equipmen
as they have in stock; therefore

Get your order in early and firmly insist upon
Firestone Demountable Rims

Demountable Rim Book and address of nearest demonstrating dealer furnished upon request

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Firestone Tire and Rubber Co

AKRON, OHIO

ches length; lists at $33; 28 inches, $36; d 30 inches, $39; this style contains ree suit cases. The Kamlee trunk is anufactured by the Kamlee Company, 9-41 Milwaukee street, Milwaukee, Wis., pecial shapes or sizes to fit rear of any r made to order at a slight additional st. This concern also makes a circular unk, made to go inside the spare tire se. It can be had in one, two, three or ur sections. It is made in the same thorgh manner as the suit case trunk and is eel reinforced throughout.

THE "MODEL" WINDSHIELD

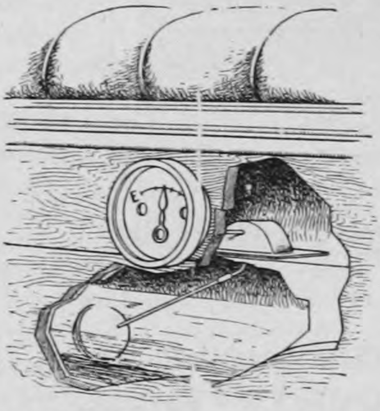
The Model Iron and Wire Works, of 2nd and Vliet streets, Milwaukee, Wis., e manufacturing the Model windshield, e particular feature of which is its simicity of construction and operation.

By means of the crescent and screw onstruction employed, the top wing of e shield can be set at any angle deired from the front seat and while the r is in motion. The shield is made of ass throughout, giving ample strength d making it possible, in case of breakge, to cast new parts from the broken embers.

HE "NATIONAL" STEAM VULCANIZER

The National Motor Supply Co., of Clevend, O., has recently placed on the market a portable vulcanizer with two vulcaning surfaces 3x5½ inches each.

This vulcanizer is composed of a brass ell filled partly full of water. It is eated by means of an alcohol torch, which rms the water into steam, thus making it

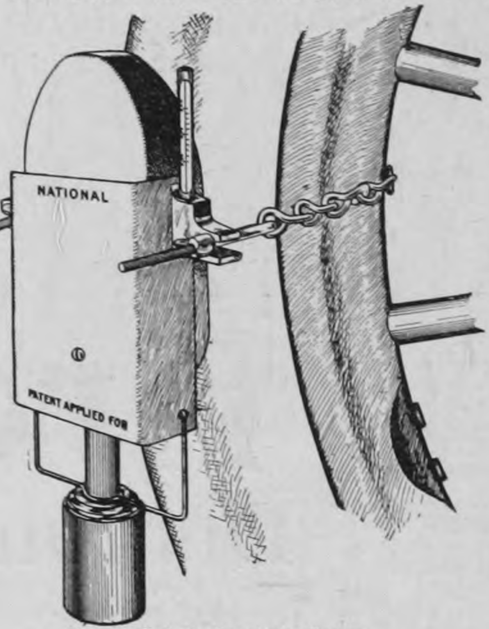


"National" Steam Vulcanizer as applied to a shoe.

n the same principles of the large steam lcanizers used in tire factories. The ame guard is interchangeable from one de of the vulcanizer to the other, and the t side is thus used for tubes, and the ncave for casings. Casings can be vulnized without removing from the wheel.

land, Ohio, has just added to its already large line of gasoline gauges the "E-Z-2-C" gauge.

As shown by the illustration this gauge is "Easy-to-See," as the dial is attached to the heel board, which makes it possible to tell the exact amount of gasoline in the

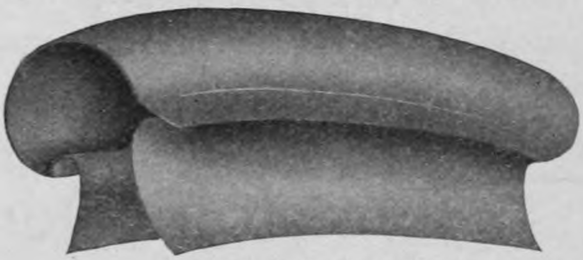


The E-Z-2-C Gasoline Gauge.

tank without even raising the cushion. The absence of all cogs, springs, etc., which is characteristic of all this company's gauges, is adhered to in the "E-Z-2-C." The hand on the dial face is attached solidly to the float ball, thus eliminating all lost motion and insuring absolute accuracy. The price of this gauge is $3.00.

THE "BARRETT" INNER SLEEVE

The Lynn Auto Company, of 2931 Sea Street, Lynn, Mass., is manufacturing the inner sleeve illustrated herewith, the same being designed for holding blow-outs and rim cuts, or to prevent blow-outs in weak places. With one of these inner sleeves in the tool box, the autoist need not worry about carrying an extra shoe.



The "Barrett" Inner Sleeve.

This inner sleeve in made exactly like the inside of a shoe, and consists of four to six ply of strong, closely woven, vulcanizing fabric, formed to exactly fit the inside of an outer casing, with two to go over the rim and hold the sleeve

At this
Big
Bunch
Of
Victories
For the One Accurate and
Reliable Speed Indicator

Ascott Park Races
Wheatly Hill S
Both Winners used Warner
Seattle Automobile Carnival
All cars equipped with Warner Auto
PORTOLA RACES
Atlanta Races

11
12
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WARNER INSTRUMENT CO.
BELOIT WISCONSIN
MILES PER HOUR
60
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694215
WARNER
DISTANCE
AUTO-METER
TRIP
1425
WARNER INSTRUMENT COMPANY
BELOIT, WIS. U.S.A.
No
PATENTED

he Model M, the Type most popular with owners of high-class cars.

The Warner
Auto-Meter

Here are the Telegraph Reports:

At the Seattle Automobile Carnival every car entered was Auto-Meter equipped. Winning cars in Five-Mile, Two Ten-Mile, Fifty-Mile, Hundred-Mile, 24-Hour Endurance and Hill Climb were paced by the **Warner Auto-Meter.**

Tanforan Races, San Francisco: In the 300-Mile Race both winners (Lozier first, Thomas second) use the Warner Auto-Meter. **Portola Race, San Francisco:** Fourteen out of fifteen cars entered were equipped with Auto-meters. Pope-Hartford first, Apperson second; both had Auto-meters on the dash.

Vanderbilt Cup Race: Ten cars out of the fifteen starting used the Warner Auto-Meter. Four used none at all. The winning Alco, driven by Grant, was helped to victory by the dependable Auto-Meter.

Wheatley Hills Sweepstakes: The Winning Marmon, driven by R. W. Harroun, was equipped with the accurate Warner Instrument.

Ascott Park Races: All seven cars in this event used the Reliable Auto-Meter as a pace maker.

At Atlanta: Buick winner 200-Mile Stock Chassis Race; Marmon winner 10-Mile Free-for-all Handicap, and National winner 10-Mile Stock Chassis Race, ALL Auto-Meter equipped.

We have said before, and we repeat it, that **wherever speed means something and even a slight departure from absolute accuracy may mean loss of money or prestige, you'll always find the Auto-Meter used to indicate that speed.** Those who have tried all kinds and KNOW, have found the Auto-Meter to be the only speed indicator they can depend on.

he Warner Instrument Co. Factory and Main Office: 671 Wheeler Avenue, **Beloit, Wis.**

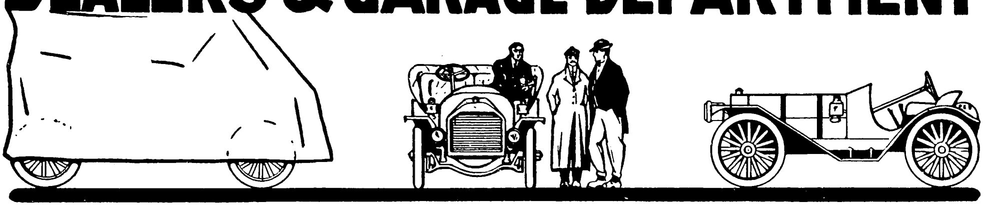
BRANCH HOUSES

EW YORK, 1902 Broadway
AN FRANCISCO, 36-38 Van

DENVER, 1518 Broadway
SEATTLE, 914 E. Pike St.

PHILADELPHIA, 302 N. Broad

DEALERS' & GARAGE DEPARTMENT



EDITORIAL

THE INCREASING NUMBER OF AUTOMOBILE AGENCIES

As the number of automobiles manufactured each year increases, and often exceeds the most sanguine expectations of the manufacturers themselves, the number of agencies also increase to keep pace. In the larger cities, established agents are gradually taking on an extended line, until it is rather exceptional to find an agency for a single car. This is almost never the case unless the machine in question is made in several models, prices ranging to suit all classes of trade. Manufacturers and agents are becoming more liberal in their views on the subject and there is not, at the present time, the objection to a single agent's handling several makes of cars that was made in the earlier stages of the automobile industry. Nearly all of the large manufacturers now have agencies in all of the principal cities, and many have extended their system to include large districts of comparatively sparsely settled country. Almost any medium-sized city now boasts agencies for nearly all of the well known makes and it is not necessary for prospective purchasers to go beyond the confines of their home town to find suitable machines at satisfactory prices.

Although a few of the larger manufacturers are establishing branch houses in the large centres, this is only being followed out by a comparatively small number and has not as yet affected the agency business.

The increase in agencies is more noticeable in the smaller towns and through the West, and is probably accounted for by the large number of serviceable and medium priced machines which are now being produced. As the number of comparatively low cost machines increases there will undoubtedly be a proportional increase in the agencies, particularly through the smaller towns and sparsely settled districts and a very large field is now opening to the energetic agent.

BUICK AUTO SUPPLY AND GARAGE CO. FORMED

The Buick Auto Supply and Garage Company was recently organized and incorporated in the state of Maine. It is a co-operative holding company with offices in Saginaw, Michigan, and plans to have subsidiary companies in every state in the Union. The plan of the company is to purchase accessories and supplies in large quantities, thereby getting them at a much lower cost. The subsidiary companies of each state will conduct garages in every city and town and there sell the supplies and accessories to members, and do repair work at a price set by the parent company.

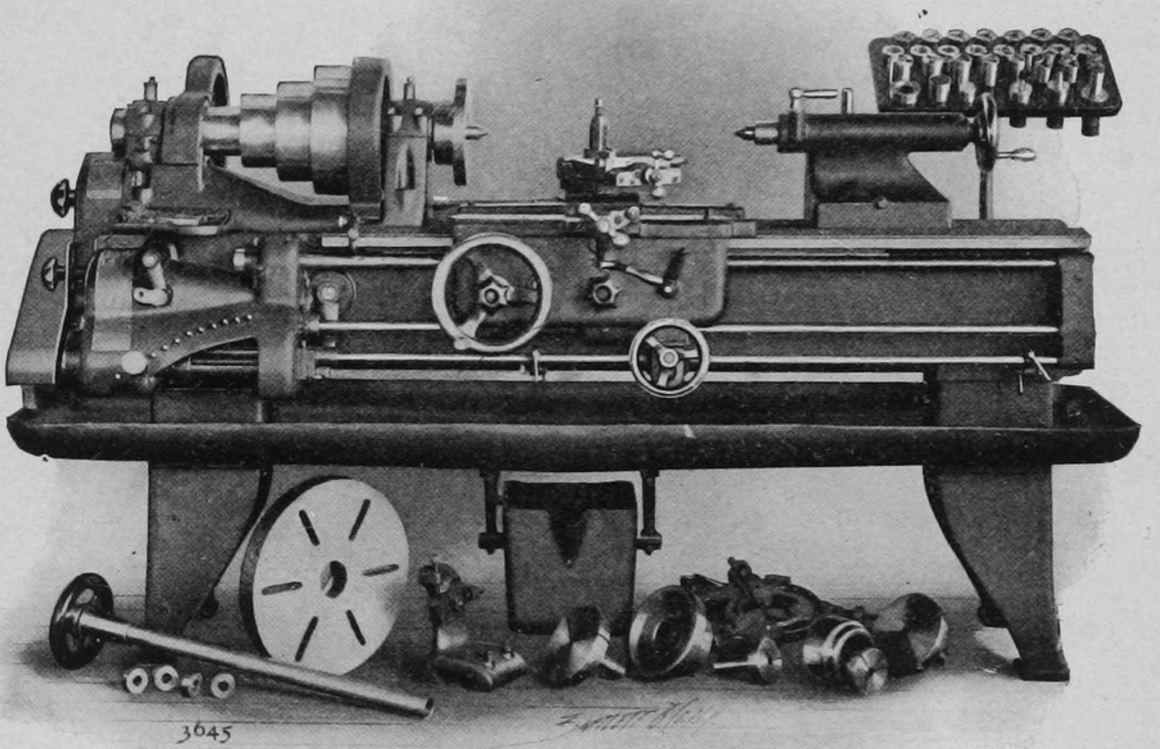
Anyone may subscribe for stock and stockholders of all companies will receive cards which will be recognized by the Buick Auto Supply and Garage Company of any other state. Information bureaus will be conducted at all garages of the companies and the members will combine their efforts to secure good roads, impartial legislation, etc.

The auto owner who has stock in any of the subsidiary companies, if he is touring in any other state and gets supplies or has repair work done simply O. K.'s the bill, which is then cleared through the parent company and sent to his home garage for collection.

The garages of this company will be at the disposal of automobile owners, who are not stockholders, at all times. They will enjoy the same service as stockholders, with the exception of the reduced cost of labor and supplies, sharing in the earnings or participation in the annual dividends.

Be sure to secure a copy of the January number of the Cycle and Automobile Trade Journal, which will contain The Buyer's Descriptive Index, a new feature of great value. The price of the January number will be the same as our regular numbers, but as the demand for this special number is always great, and as this added feature will undoubtedly increase the demand for that number, we advise our readers who are not subscribers, to send in their subscription immediately, so as to be sure to have it started with the January number.

Automobile Manufacturing and Repair Shop Equipment



The P. & W. 16 in. Precision Engine Lathe

A machine representative of the most advanced ideas in lathe design and construction.

Excels in accuracy and working capacity other lathes of the same nominal dimensions.

Twenty-five per cent. heavier than most lathes of equal or even greater swing.

Provided with a precision lead screw, used only for thread cutting.

Separate splined shaft for turning.

Has broader facilities, greater conveniences and more economic applications than any other lathe on the market.

The only concern in the world that can furnish a complete economical equipment for manufacturing and repairing any part of an automobile.

PRATT & WHITNEY CO., HARTFORD, CONN.

NEW AGENCIES.

New York, N. Y., Imperial Motor Vehicle Co., Grout.

Denver, Col., Sanford Auto Co., Croxton-Keeton.

Helena, O., J. F. Metzler, Great Western.

Lynn, Mass., C. E. Whitten, Thomas.

Salt Lake City, Utah, Rooklidge-Gilmer Co., Croxton-Keeton.

Reading, Pa., D. B. Hoffer & Sons, Haynes.

Nicholasville, Ky., C. A. Kenney, Great Western.

Willimantic, Conn., Arthur Hills, White Gasoline Car.

Chicago, Ill., W. G. Tennant, Marmon.

Grand Forks, Mich., Anderson & Strong, Mitchell.

Atlanta, Ga., Interstate Sales Co., Interstate.

Los Angeles, Cal., H. O. Vogel, Great Western.

Pittsburg, Pa., L. A. Randal, Moon.

Detroit, Mich., Overland Sales Co., Overland.

Indianapolis, Ind., Henry Wilke and Son, Winton.

Perry, N. Y., Geo. H. Peddle, Great Western.

Sheldon, Ill., Shelden Auto Garage, Great Western.

Salt Lake City, Utah, Taxicab and Automobile Co., Cartercar.

St. Louis, Mo., Albert Sterne Motor Car Co., Great Western.

Indianapolis, Ind., Henry Wilke & Son, Winton.

Peru, Ind., O. B. Shutt, Great Western.

St. Louis, Mo., James L. McDonald, Knox.

GARAGE NOTES

Albert Johnson is erecting a two-story 50x 130 foot garage at Atlantic, Ia.

The Dixon C. Walker Automobile Company is erecting a one-story brick garage at Charles and Twentieth streets, Baltimore, Md. The new building will be 98x85 feet in size, cost about $15,000 and will be equipped with the most up-to-date machinery.

William F. Wagner is building at Canton, O., a three-story brick garage to replace the one recently destroyed by fire, at Erie and North streets.

W. H. Herriman is building a 36x50 foot garage at Clear Lake, Ia.

A one-story brick and steel garage is being built at 6502 Euclid avenue, Cleveland, O., for Zimmerman and Winters.

Prosser & Serumgard, Devil's Lake, N. D., are erecting a $7,000 garage.

Hibbing, Minn., now has its first garage. It was just recently completed by the Mesaba Auto Company.

J. Stanley Smith is erecting a garage at the corner of Main street and Third avenue, Lewistown, Mont.

John Sanderson, Mt. Vernon, O., is erecting a $3,500, three-story brick garage.

The Mayville Motor Company is erecting a 50x130 foot, one-story garage on Main street, Mayville, N. D.

Allen Cox is having a cement block garage built at Peary, Ia.

A. Marckel, of Perham, Minn., is building a 50x90 foot garage.

A $50,000, 84x128 foot reinforced concrete garage is being built at Center avenue and Craig street, Pittsburg, Pa.

A garage has been opened on Russel street, Pocatello, Idaho, by Cecil Culler and Norman Salley.

The Standard Garage was opened in the Port Clinton, O., armory by F. H. Dewitt and S. J. Matthews.

The Joslyn Automobile Company, of Rockford, Ill., recently purchased a tract of ground 157x112 feet at South Church and Chestnut streets, upon which it is erecting a garage.

The Central Garage Co., has established a large up-to-date garage at Twelfth and Chestnut streets, St. Louis, Mo.

The Salem (Ohio) Auto Cycle Co. recently opened a garage on East Main street in a new concrete building.

An up-to-date garage, 50x110 feet, is being erected for Messrs. Livingston and S. Stafford at the corner of Plant and Hart streets, Saratoga Springs, N. Y.

A garage is being built on Brodie street, Scranton, N. D., for Howard Akin and Harry Kennedy.

A brick and stone garage is being built on Shaker Heights, Cleveland, O., for O. P. & M. J. Van Swearingen.

A 65x50 foot one-story stone and tile garage is being erected on Chestnut street, Sharon, Pa., and when it is completed will be occupied by Edward Davis.

F. A. Tetley, of Riverside, Cal., is erecting a $3,000 garage at the corner of Market and Tenth streets.

The Tuscola Automobile Co. is erecting a garage at Tuscola, Ill.

N. Gauche is erecting at Valley City, N. D., a cement block garage.

L. A. Wilson, of Berlin, Wis., has opened a garage at Wheaton, Minn.

Frank Hodey, of Whitemarsh, Pa., is building a 25x35 foot garage.

An $8,000 two-story fire-proof stone and concrete garage is being erected at 515-21 Tatnall street, Wilmington, Del. The new building, to be known as the Delaware Garage, will have a capacity of 75 cars.

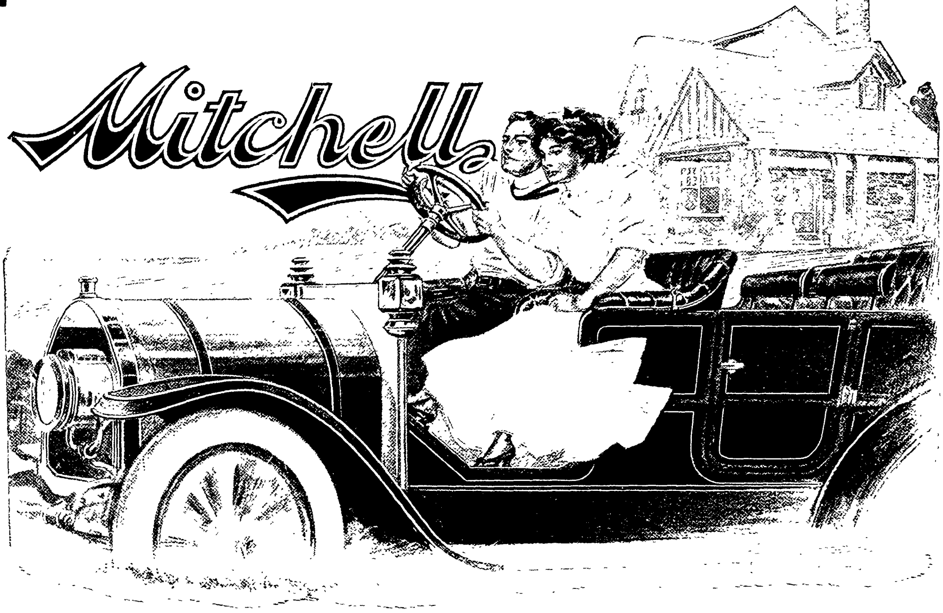
RUSHMORE INCREASES SALES AGENCIES

The Rushmore Dynamo Works, Plainfield, N. J., makers of the Rushmore Lens Mirror searchlights, has established in addition to their regular branches at Paris, London, Manchester and Dublin, agencies in Berlin, Christiana, St. Petersburg and Riga, where large stocks of Rushmore products will be carried. It will now be possible to get Rushmore lamps and generators almost any place where automobiles are used.

To take care of the increased demand caused by this the company has installed another 140 H. P. slow speed producer gas engine and dynamo weighing over thirty-five tons, which will increase their power house capacity to over 500 horsepower.

The E. R. Thomas Motor Company, of Buffalo, manufacturers of the Thomas Flyers, have established a branch in Chicago, temporarily located at 1325 Michigan avenue, with Mr. Cal. T. Paxson as manager.

The Continental Caoutchouc Co. has opened a Chicago branch at 1412-14 Michigan avenue where the Continental tires and demountable rims are being supplied to the Middle West. The new branch is under the management of C. A. Gilbert.



The Mitchell Model "S"

SIX-CYLINDER—FIFTY HORSE-POWER—130 INCH WHEEL BASE

A KING'S CAR AT YOUR PRICE

Possessing all the quality of the high-priced cars, yet sold closer to its actual value than any other big car in the world.

A car which shows what can be done when the desire exists—and when a car is built to the minutest detail in one's own factory, where values can be estimated to a hair.

We have just completed the finest automobile works in America and the first effect of our increased facilities is better cars for the same money in two instances and a better car for less money in another.

The Mitchell Six is a direct development of the Mitchell Four of 1909. We have added two cylinders—increased the horse-power from 40 to 50—lengthened the wheel base to 130 inches—put on new and better springs—improved the beauty of lines and finish—and all without adding a penny to the price of the 1909 car—$2,000.

This is as classy and aristocratic a car as there is in America and it mustn't be embraced in the "cheap car" class, for it contains precisely the same materials as are used in the highest priced cars and is **cheap** only in price.

It will be the buy in 1910.

SPECIFICATIONS:

MOTOR:	4¼x5 inches.	TOOL BOXES:	Steel baked enamel.
TRANSMISSION:	Selective type.	SEATING CAPACITY:	Seven Passengers.
WHEELS:	36x4 inches.	STEERING WHEEL:	Natural finish.
WHEEL BASE:	130 inches.	SPRINGS:	Platform type.
IGNITION:	Magneto and dry Cells.	BODY OPTIONS:	Seven passenger touring or close coupled body.
COLOR:	Dark blue, cream running gear. Option: Dark maroon, cream running gear.	EQUIPMENT:	Oil lamps and horn, full tool equipment, including a jack.

PRICE, $2,000—F. O. B. RACINE

Mitchell Motor Car Co.
Racine, Wis. U. S. A.

NEW NEW YORK AUTO FIRM

The Colt-Stratton Co., with salesrooms at the northeast corner of Broadway and 68th street, are among the newcomers in the "Automobile Row" of New York. The officers of the new concern are well known in the business world. William L. Colt, former president of the Cleveland Motor Car Co., holds the same office with the new company. The vice-president, Harry L. Stratton, held a similar office with the Amalgamated Copper Co., for several years. The secretary is Sydney H. Veal, who was until recently the secretary of the Cleveland Motor Car Co.

The Colt-Stratton Co. handles the "Cole 30" from Indianapolis, selling at $1,500 and the "Paige-Detroit Roadster," made in Detroit, and selling for $800. The new concern is distributer for the entire eastern territory for the "Cole 30" and has a territory for the Detroit car of 50 miles around and including Greater New York.

RETAIL NOTES.

The Interstate Sales Company was recently organized in Atlanta, Ga., and has opened salesrooms at 115 Auburn avenue, where the Interstate is being handled.

Chas. E. Miller, maker and dealer in supplies and accessories, recently opened an Atlanta Branch, at 66 Edgewood avenue.

The Piedmont Motor Car Co., has been capitalized at $15,000, and has located at Auburn avenue and Ivy street, Atlanta, Ga. The Parry "30" and Stoddard-Dayton cars are being handled.

The White Auto Co., Baltimore agents for the White cars, is erecting a three-story, 163x77 foot garage and salesroom at Mt. Royal avenue and Hunter alley.

An American Simplex branch has been opened at 261 Dartmouth street, Boston, Mass. W. Mason Turner is the manager.

The Overland Sales Company has been organized in Detroit with offices and salesroom at 295 Jefferson avenue to handle the Overland.

The Palmer Auto Co., has opened the Detroit Stearns agency and garage at 1221-9 Woodward avenue.

A. O. Anderson and M. L. Strang have formed an automobile company in Grand Forks, and will handle the Mitchell in ten counties in Michigan.

The Dwight garage and salesroom for the "Velie" was recently opened in Grand Rapids, Mich.

Enos and Bradford have opened a garage and Fuller salesroom at 4 Pearl street, Grand Rapids, Mich.

The Genung Motor Car Co. will handle the Fal car at 1716 Grand avenue, Kansas City, Mo., to which place it has succeeded the Tabeau Motor Car Co.

The latest addition to the automobile colony of Louisville, Ky., is the Dunham-Yager Company. This firm is composed of Geo. Dunham and Roy Yager, both of whom are well-known locally. The company will handle the Peerless and Velie cars.

Lang and Scharmann are erecting a modern garage at Marshfield, Wis., where they will handle the Maxwell.

The Mishawaka Livery and Garage Company has opened the pioneer garage and accessory salesroom in Mishawaka, Ind., at 215 West Second street.

The Anthracite Motor Car Company has opened a garage and salesroom at 625 Lackawanna avenue, Scranton, Pa., where it will handle the Overland and Corbin cars.

An 80x100 feet garage is being erected at Sanford and Court streets, Springfield, Mass. When completed it will be used by the Morse-Readio company who besides building cars, conduct a repair business.

The Empire Car Company has opened a garage and salesroom for Premier cars at 231 Wyoming avenue, Washington, D. C.

RECENT INCORPORATIONS.

Antola, Ind., Universal Tire Protector Co., to manufacture tires, capital, $30,000.

Birmingham, Ala., Great Southern Automobile Company, to manufacture autos, capital, $100,000.

Camden, N. J., Bard Automobile Company, to manufacture and sell automobiles, capital, $25,000.

Chicago, Ill., Ideal Electric Company, to manufacture automobiles, capital, $15,000.

Cleveland, O., Reliance Motor Truck Sales Company, capital, $30,000.

Cleveland O., Riiionu Motor Truck Sales Company, capital, $30,000.

Columbus, O., Toledo Motor Co., increased capital from $10,000 to $2,000,000.

Dallas, Texas, Baker Cameron Automobile Company, capital, $30,000.

Echo, Suffolk County, N. Y., Only Car Company, to manufacture autos, vehicles, engines, aeroplanes, motorboats, etc., capital, $300,000.

Ensley, Ala., Great Southern Automobile Co., capital, $100,000.

Jacksonville, Ill., Jacksonville Automobile Co., to deal in autos and accessories, capital, $2,500.

Jersey City, N. J., Suburban Motor Transit Company, to operate automobiles, etc., capital, $100,000.

Louisville, Ky., Marshall-Clark Motor Car Company, capital, $20,000.

Manhattan, N. Y., Empire Automobile League, to manufacture cars, boats, motors, engines, machines, etc., capital, $50,000.

Marion, Ind., Wearwell Rubber Company, to import, manufacture and deal in rubber and rubber products, capital, $12,000.

Oklahoma City, Okla., Dixie Motor Car Company, capital stock, $100,000.

Springfield, Ill., Springfield Motor Car Company, to manufacture and deal in automobile parts and accessories, capital, $1,000,000.

Toledo, O., Wood-Kessler Auto Company, capital, $12,000.

West Orange, N. J., Motor Parts Co., to manufacture motors, engines, machines, etc. capital, $125,000.

Wilmington, Del., Delaware Garage Company, capital, $1,000,000.

Woodsdale, W. Va., Woodsdale Motor Car Co., to deal in autos, capital, $5,000.

George T. Gould, who for the past year has been connected with the Rainier selling force in New York City, has been appointed New England agent for Rainier cars, with headquarters in Boston.

The Cumberland Construction Co., of Bristol Tennessee, Va., is building a garage on Shelby street, next door to the new Elks' Home Building, 42x90 feet and two stories high; the building will be used for a salesroom and garage.

The company would like to correspond with manufacturers of automobiles and supplies, as they have not yet made all of their connections.

POWER

The whole world is demanding just that—**POWER.**

Just as the material rewards of the business world go to the man who has in him that nameless something that men call power, so, too, the awards of the automobile world go to that car which has beneath its bonnet the same wonder-working thing.

Only—in the motor's sphere that something is no longer nameless - it is called

PERFECT IGNITION

It is not enough that you have an ignition system which never fails—though heaven knows that is important enough—but you must also have a system which

GETS THE MOST FROM YOUR ENGINE

That's all there is to it—just get the most out of your engine and to do that

THE SPARK MUST BE HOT

And a **HOT** spark means Magneto Ignition. Batteries, even when new, are but a makeshift. And when they are old—you know, you who have had them on your car. Yet a **GOOD** battery is better than a **POOR MAGNETO**; for a generating unit which is not dependable is worse than useless.

A dependable hot spark—even that's not enough the spark must occur in each cylinder at exactly the right time; it must be synchronized.

The following pages will show how and why the

K-W Magneto Is Best

Dependability
Hot Spark
Synchronism

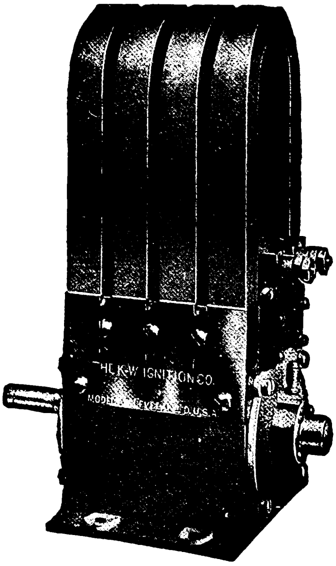
THE K-W IGNITION COMPANY

40 Power Ave., Cleveland, Ohio, U. S. A.

N. Y. Agency: 1686 Broadway, New York.
N. E. Agency: 70 Long Wharf, Boston, Mass.
Chicago Agency: The Automobile Supply Co., 1339 Michigan Ave., Chicago, Ill.
Philadelphia Agency: Jas. L. Gibney & Bro., 215-217 North Broad Street.
For sale by the Canadian General Electric Co., Toronto, Canada.

SIMPLICITY

THE K-W MAGNETO



Model AL for Jump Spark

Has only one moving part—could anything be simpler than that? Just a revolving armature, mounted on ball bearings; that is all there is to it—no moving wires—no brushes—no triggers—no anything that can get out of order. The K-W has **FEWER PARTS** than any other Magneto made; that means

DURABILITY

The fact that our design and workmanship are the best, and our Magneto the most powerful, is the reason that we get a really

HOT SPARK

The fact that the spark from a K-W Magneto is so much hotter than that from any other source of current is the reason that you can **START YOUR ENGINE** on the Magneto every time as easily as on **good** batteries. And it is also the reason that your engine will **RUN WITHOUT MISSING** and will develop 20 to 30 per cent. **MORE POWER.**

The K-W Magneto will run your

ELECTRIC HEADLIGHTS

perfectly and give you **more** light, and **cheaper** light, and **less bothersome** light than a gas tank—and it is the **ONLY** Magneto that will do it and at the same time furnish the hottest and best spark for your engine. No other Magneto is powerful enough to do this.

In order to get absolute

SYNCHRONISM

you will want a

K-W MASTER VIBRATOR

Used in connection with your old coil and a K-W Magneto this device will wonderfully improve the running of your engine, besides freeing you from the nuisance of vibrators sticking, pitting and burning off. It is greatly to be preferred to even the **BEST** distributor system and is at once cheaper and easier to install, since its price is only $15.00. But no amount of money can buy a better device—nor even as good a one.

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For sale by the Canadian General Electric Co., Toronto, Canada.

WATER

IS A FINE DRINK

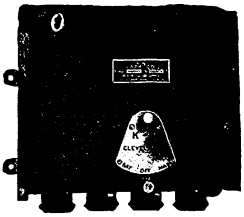
—But not for SPARK COILS.

It is just that tablespoonful of water that is found in **ALL** other spark coils that causes their windings to break down after a certain amount of use. We, and we only, go to the expense of making **ABSOLUTELY SURE** that our coils contain no moisture whatever.

The
K-W COIL

Does Not Contain a Single Particle of Moisture

AND HERE IS WHY



Four-Cylinder Coil and Switch. Price, $30.00
Other prices on application

The windings for a K-W Coil are placed on end in an absolutely air-tight steel vat. This vat is steam-jacketed and is heated to 250 degrees.

Now water boils at 212 degrees, so you can imagine what happens in that vat. After **six hours** of this heat we suck out every **PARTICLE OF WATER** and every bit of air and other gas.

The windings are now 10 per cent. lighter than before treatment and are so dry that the most careful scientific analysis fails to show even a trace of moisture.

Next the **PERFECTLY DRY** molten dielectric, or insulating, solution is forced into the coils under a pressure of 125 pounds to the square inch. We keep up this pressure for **three hours** more and by that time every remote part of each winding is perfectly impregnated and no electric strain can possibly break them down.

Nothing short of a sledge can hurt them.

Other things being equal, this one item of being absolutely anhydrous would alone make the K-W Coil rank first; but we are not satisfied with that—we want a coil that is **BEST AT EVERY POINT.**

So we use a special Platino-iridium alloy that is worth **twice its weight in gold.**

Then, too, our vibrator is three to four times as fast as other makes. All of which means a hotter spark on **LESS CURRENT**, and longer life.

WHEN YOU USE THE BEST MAGNETO—
YOU SHOULD USE THE BEST COIL, THE K-W

THE K-W IGNITION COMPANY

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Philadelphia Agency: Jas. L. Gibney & Bro., 215-217 North Broad Street.
For sale by the Canadian General Electric Co., Toronto, Canada.

K
W

IT WOULD
BORDER
ON THE ABSURD

to suppose
that you haven't

SEEN

the three preceding
pages—but you should

READ

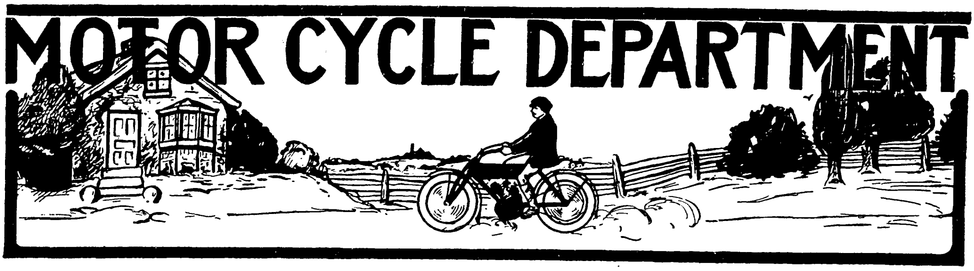
them—they tell of

K-W Coils
Magnetos
Master Vibrators

THE K-W IGNITION COMPANY
40 POWER AVENUE, CLEVELAND, OHIO, U. S. A.

N. Y. Agency: 1686 Broadway, New York. Chicago Agency: The Automobile Supply Co.
N. E. Agency: 70 Long Wharf, Boston, Mass. 1339 Michigan Ave., Chicago, Ill.
Philadelphia Agency: Jas. L. Gibney & Bro., 215-217 North Broad Street.
For Sale by the Canadian General Electric Company, Toronto, Canada.

MOTOR CYCLE DEPARTMENT



EDITORIAL

WHY NOT ON MOTORCYCLES?

Automobile manufacturers are now arranging many little conveniences which add materially to the pleasure of motoring. These additions are, as a rule, incorporated as a part of the general design. "Are the motorcycle manufacturers as progressive in this respect?" is a question which is being brought up by the more advanced riders. How many motorcycles have their gasoline tank divided so that a reserve supply can always be depended upon? As far as we know there is not one on the market. This is a simple matter to arrange, and is comparatively inexpensive as a separate tank is not necessary. Such an arrangement would, however, add greatly to the enjoyment of motorcycling, as it is only a question of time when the most careful rider gets caught on the road without fuel. To push the machine or pedal it on a hot, dusty road, to the nearest source of supply is not conducive to the sale of motorcycles, particularly where the machine has not a free engine. This, of course, is offset to a certain extent by being able to relieve the compression, but even then it is hard work when pedalling has to be resorted to for any length of time. With a reserve supply, it is impossible for the rider to be placed in this awkward predicament, and as it does not necessarily add more than a few ounces to the weight, it would seem to be a feature worth incorporating in the up-to-date motorcycle, the same as it has been in the motor car.

The matter of carrying space is another feature which, although more difficult to arrange on a motorcycle, owing to its general construction, is a refinement which has not yet received as much attention as it should. Most makers seem to be content if spaces are arranged for the actual and absolute necessities and no further effort is made to provide a place for extra inner tubes, the lunch, or the hundred and one small articles that it would be of advantage to take, if only there was a suitable place to carry them.

Occasionally it happens that an extra shoe is needed, either due to a blow out, rim cutting, or a badly cut tire from glass or other road impediments. So far none of the makers have attempted to arange an extra shoe carrying cover or case, which might readily be done, and which would be of decided advantage to those who use the motorcycle for extended trips. Such a case could be arranged to fit snugly against the side of the machine at the rear, being clamped to the rear forks and seat support.

The general accessibility and convenience with which the small tools which are always carried are arranged, also means much to the rider. In some instances it is almost impossible to get the tools out with any speed, and the cases for them are so cramped and small that like Pandora's box, it is more or less of a puzzle to get them all back in again after they have all been taken out.

We do not make these remarks in the spirit of criticism but more in the light of suggestions as we feel that a great deal more can be done for the comfort and convenience of the motorcyclist that has yet been attempted.

A motorcycle club was recently organized in Dallas, Texas, with about twenty-five members.

Two Excelsior motorcycles have recently been purchased by the Houston Light and Power Company for their repair men.

J. D. Hallman & Co., 542 Park street, Allentown, Pa., have recently taken the agency for the C. V. S. motorcycle, manufactured at 2958 Diamond street, Philadelphia.

Have you carefully considered the immense value of the great January special issue of The Cycle and Automobile Trade Journal? It will contain "The Buyer's Descriptive Index." Full particulars on pages 200, A to D.

The following have been elected officers of the newly organized Easton, (Pa.) Motor Cycle Club: President, Charles Glackin, of Phillipsburg, N. J.; Treasurer, Allen Hoffman, of Raubsville; Secretary, Charles R. Boyer; Captain, J. S. Deysher, of Easton.

AMERICAN MOTOR CO. BUILDS

The American Motor Co., of Brockton, Mass., well known maker of the M. M. motorcycle, has recently started an addition to its factory in the shape of a two-story building, 100x50 feet. Although the new addition is well under way, still the concern finds that it will be necessary for it to add twice as much space within the near future.

A number of automatic machines have been installed. For 1910 extreme care will be given to gauging every piece put into the machines. Every piece in the M. M. product will have to pass through three sets of limit gauges, and the final inspection gauge will permit of a variation on ground work of only one-quarter of a thousandth and on ordinary screw machine work, three-quarters to one and one-half a thousandth. This insures absolute interchangeability and positively prevents any inaccurate part entering into the construction of the 1910 M. M.'s.

GOOD TIMES ON GUTTENBERG TRACK

Over two thousand persons witnessed the race meet held on Sunday, November 7th, by the Combined Motorcycle Clubs of New York on the Guttenberg Track at Guttenberg, N. J. The most interesting event of the day was the two mile flag race, the regulations of which required each man as he finished his first mile, to pick a flag from the ground while going at full speed. L. H. Gutterman, of the Harlem Club, led a field of ten, and succeeded in snatching his flag while going at the rate of a mile a minute. He finished the two miles in 2 minutes and 4 1-5 seconds finishing fully 100 yards ahead of the nearest contestant, J. Buckingham of Yonkers. The only other man to pick up his flag was J. F. Fox, but he did not have gasoline enough to finish the two miles.

A Miss Dorothy Rice, of New York, who wished to compete in the 5-mile event, was ruled out by Dr. Thornley, who added that any one who loaned her a machine would be suspended for a year. Before he arrived at the track, however, Miss Rice had ridden a trial mile in 1 minute, 13 seconds.

The summaries of the winners of the various events are as follows:

One-mile Speed Judgment Race (average speed of thirty-five miles)—Joseph Buckingham, New York; time, 1.42.

Six-mile Relay (interclub team race) Harry Mapp and A. G. Chapple, New York Club; time, 7.22 2-5s.

Quarter-mile Slow Race—M. P. Sullivan, Concourse Club, New York; time, 1.5 2-5s.

One-mile Fast Race—Charles Capelo, New York; time, 1.7 3-5s.

Five-mile Four-cornered Match—A. G. Chapple, New York; time, 6.4 1-5s.

Two-mile Flag Race—L. H. Gutterman, New York; time, 2.4 1-5s.

Five-mile Handicap (30.50 cu. in.)—Edward Swain, New York; time, 6.28s.

One-mile Grab-bag Race—Frank Hart, New York.

Two-mile Novelty Race—Frank Hart, New York, time, 3m.

Ten-mile Handicap—Walter Goerke, Brooklyn, 3 minutes; time 11.37 2-5s.

PHILADELPHIA MOTORCYCLE RACE MEET

The Philadelphia Motorcycle Trades Association held its annual fall race meet at Point Breeze track on October 30. The main event was the 25-mile open race which was won by Walter Goerke on a 7 h. p. Indian in 27.25. Semour made the best time in the one mile trials, riding his Reading Standard around the course in 1.00. The summaries are as folows:

Five-mile novice race—S. Albertson, 4 H. Harley-Davidson, won; J. Martin, Reading-Standard, second; H. H. Kirkpatrick, 3½ H. Indian, third. Time, 7.00 3-5.

Ten-mile single cylinder—R. Seymour, 4 H. Reading Standard, won; W. Tuebner, 4. H. Merkel, second; A. Klein, 4 H. Reading Standard, third. Time, 11.11 1-5.

Ten-mile 61 cubic inches, open—Walter Goerke, 7 H. Indian, won; H. Klebes, 7 H. Reading Standard, second; W. Tuebner, 7 H. Merkel, third. Time, 10.15 1-5.

Five-mile, thirty and one-half cubic inches—H. Klebes, 4 H. Reading Standard, won; L. Steinhauser, 3 H. Bradley, second; A. Klein, 4 H. Harley-Davidson, third. Time, 6.08.

Twenty-five-mile open—W. Goerke, 7 H. Indian, won; H. Klebes, 7 H. Reading Standard, second; R. Seymour, 6 H. Reading Standard, third. Time, 27.25 4-5.

Time trials, one mile—R. Seymour, 6 H. Reading Standard. Time, 1.00. H. Klebes, 7 H. Reading Standard. Time, .59 1-5. W. Goerke, 7 H. Indian. Time, 1.03, 1.01.

The New York Motorcycle Club has decided to establish permanent quarters on Broadway, between 102nd and 103rd Street

The "Buyer's Descriptive Index" will appear for the first time in the January, 1910, issue of The Cycle and Automobile Trade Journal. It is a pronounced improvement on the already well known features of this great annual number which is a year book of the trade. Do not overlook this fact.

The Stockton Motor Cycle Club, of Stockton, Cal., has been organized with 12 charter members. Its purpose is to promote the sport of motorcycling in that county by having runs, races, socials, etc., and like all other motor cycle clubs, to become affiliated with the American Federation of Motor Cyclists.

Something new in the line of wedding celebrations was pulled off recently by members of the Cincinnati Motorcycle Club when one of their number was married. The members pushing their machines silently gathered under the window of the newly married couple and turned the engines of their machines loose. This serenade resulted in the appearance of the bride and groom who were then given a handsome present.

Does

THE FLYING MERKEL

Ball Bearing Motor have anything to do with this?

¶ In the recent Atlanta, Ga., contests R. Walthour on a *Flying Merkel* won the 20-mile professional. He also won the 10-mile professional, making the fastest time in the event ever made on a motorcycle on a dirt track. Time, 8:36. Merkel riders also won three seconds at this meet.

¶ Out in Los Angeles, on the 7th of last month, this is what happened. Four miles for private owners, $30\frac{1}{2}$ cubic inches—won by Irwin Knappe, on a *Flying Merkel.* Time, $4{:}59\frac{1}{5}$. Five miles amateur, free-for-all, singles—won by Charles Balke, on a *Flying Merkel.* Time, $4{:}28\frac{3}{5}$. Four miles, professional open—won by T. M. Samuelson on a *Flying Merkel.* Time, 3:07.

¶ We have a catalog and Agency proposition ready — if you are.

Merkel-Light Motor Company

Pottstown, Pa.

The 1910 M. M. Motorcycle

The American Motor Co. of Brockton, Mass., will market three models of the M. M. motorcycle for the coming season. The three models are a 3½ H. P. battery special, a 4 H. P. single with magneto ignition, and a 7 H. P. twin with magneto.

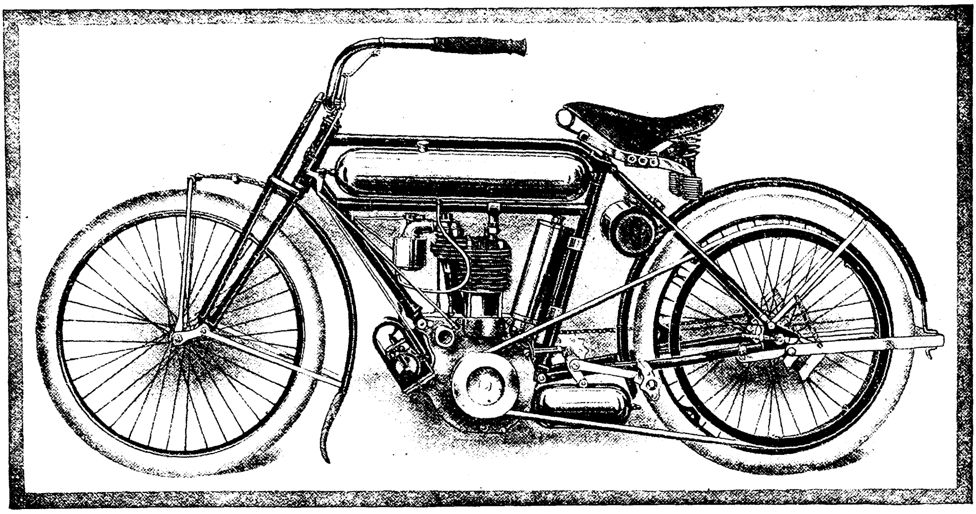
Both have been improved in many respects; mud guards are of aluminum, the stand is so arranged that it is raised by two coil springs and latched automatically when not in use, roller bearings are used throughout in the twin motor, etc.

The leader of the M. M. line, however, is the 4 H. P. Magneto Single. In this machine the frame design, spring forks, 26 inch wheels and cylindrical nickeled gasoline tank are similar in general appearance. Otherwise the machine is greatly altered in both make-up and appearance. Instead of the motor being supported in the frame with the head secured to the seat post mast it is set vertically, the frame being reinforced by an added upper tube to which the head is bolted.

Aside from the upright location of the engine the other points of difference are, briefly, mechanical inlet and exhaust valves, roller bearings throughout in the motor, a mechanical oiling system in addition to the hand pump, larger tank capacity for both fuel and oil, thirty pound fly-wheels, gear drive for the magneto and other improvements of less importance.

Rated at 4 H. P. the motor is just within the 30.50 cubic inch F. A. M. rating. It is set vertically in the frame, secured at the base to both front and rear down tubes and at the head to the upper reinforcing tube. The engine base is of aluminum castings bolted together, to which the machined cylinder and cast head are bolted as in the 1909 M. M. models. The piston is similar, that is, with domed head, two rings and gudgeon pin security ring.

The base is larger, to accommodate heavier fly-wheels. The latter weigh thirty pounds, the additional weight being carried in an added inch in circumference. The connecting rod is slightly heavier, with an enlarged "big end" and roller bearing. The exhaust valve plunger, push rod, etc., are located the same as before. In fact, the whole exhaust valve arrangement is similar except that the new valve is 1⅞ inch in diameter, and the push rod is made adjustable to take up wear. The inlet valve is 1⅞ inch in size, located directly above the exhaust valve, and mechanically operated.



The M. M. 4 H. P. Single, with Magneto Ignition.

The inlet valve is operated by a push rod and rocker arm arrangement, the rod being actuated by a plunger that is lifted by a latch on the intermediate gear shaft. This latch is similar to the one used in the exhaust valve mechanism. The valve opening is positive in the new arrangement there being no chance for the push rod to accidentally work loose and become lost. The inlet valve can be quickly converted from a mechanical into an automatic valve. The inlet push rod is also made adjustable so that any amount of wear can be taken care of.

A mechanical oiling system has been placed on the new model, and which is absolutely "fool-proof." It is, briefly, as follows: a drip feed into the engine base with a pump that forces all surplus back into

Thor

THE
MOTORCYCLE
SUPREME

THOR IV
SINGLE

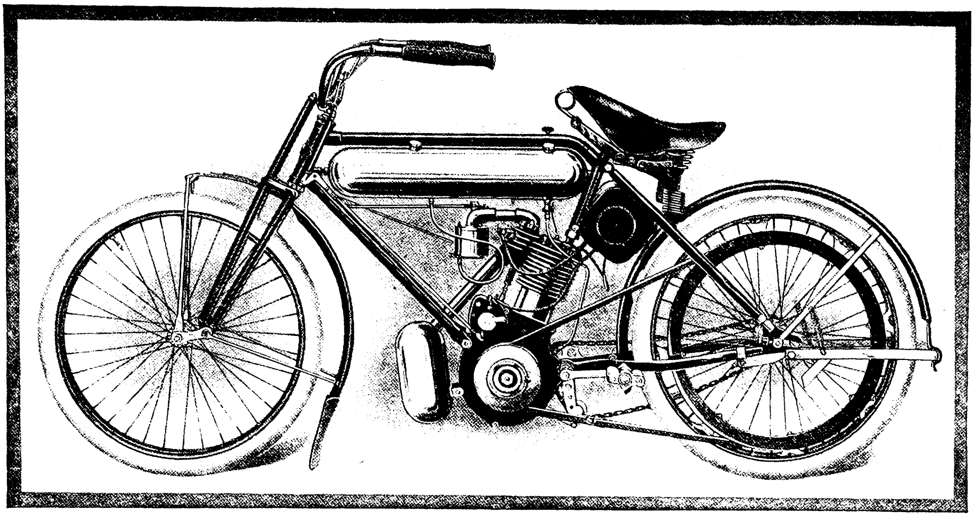
¶ The Greatest Motorcycle ever presented to the Public. Look for it at the following Shows:

New York, January 8th to 15th, 1910.
Chicago, February 5th to 12th, 1910.

In the meantime, write and secure agency. It's a money getter.

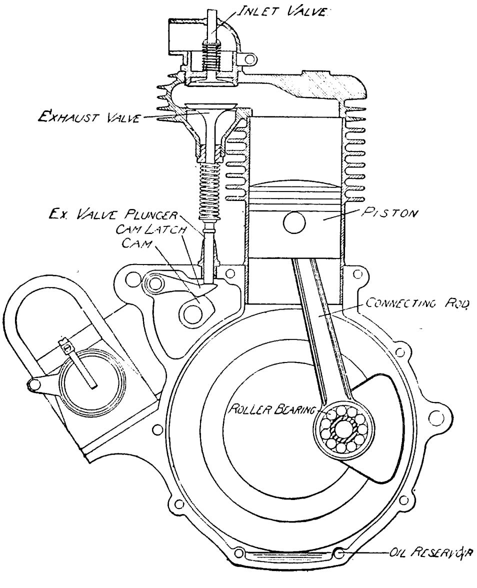
AURORA AUTOMATIC MACHINERY CO.

Thor Building, 1307 Michigan Ave., CHICAGO, ILL.



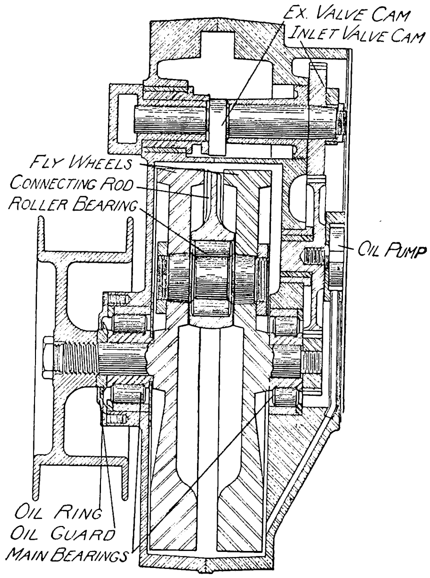
The M. M. 3½ H. P. Battery Special.

the tank. In addition there is a hand pump in the tank that can be used for emergencies. The tank will be cylindrical in shape, of seamless brass tubing, 1½ quarts capacity. It is secured to, and just ahead of, the rear down tube. The oil will drip from this tank directly into the engine base. The drip tube is large enough to allow the heaviest oil to flow in a constant stream. The pump is of the rotary type enclosed in the gear case, and it pumps all the oil above a certain level in the base back into the tank. This level is fixed by means of a stand-pipe.


INLET VALVE
EXHAUST VALVE
EX. VALVE PLUNGER
CAM LATCH
CAM
PISTON
CONNECTING ROD
ROLLER BEARING
OIL RESERVOIR

Sectional view of the 4 H. P. M. M. Motor.

Another one of the improvements in the new motor is the separation of the valve operating mechanism into a compartment of its own. A partition has been made across the forward end of the engine base. This insures a perfectly clean motor, as the crank base compression is confined entirely to the base and there is no possibilty of oil being forced out above the plunger guides or other openings.


EX. VALVE CAM
INLET VALVE CAM
FLY WHEELS
CONNECTING ROD
ROLLER BEARING
OIL PUMP
OIL RING
OIL GUARD
MAIN BEARINGS

Section showing roller bearing construction in the M. M. Motor.

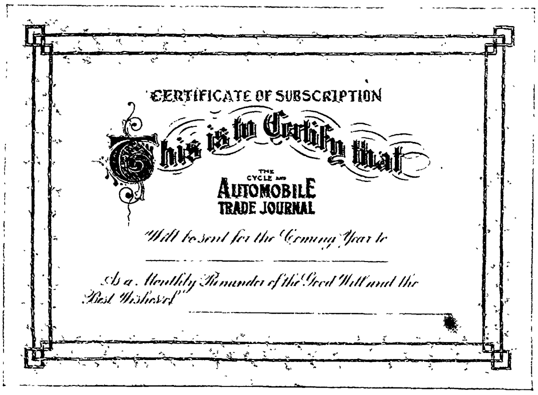
The Bosch magneto in this new model is set forward of the motor, on a platform cast integral with the base, and is driven by a chain of three gear wheels. These

An Excellent Christmas Gift

A Subscription to the

CYCLE AND AUTOMOBILE TRADE JOURNAL
(Published in Philadelphia)

THIS is a small reproduction of the handsome subscription certificate we will issue



CERTIFICATE OF SUBSCRIPTION

This is to Certify that

THE CYCLE AND AUTOMOBILE TRADE JOURNAL

Will be sent for the Coming Year to

As a Monthly Reminder of the Good Will and the Best Wishes of

AN inexpensive but practical Holiday reminder is a subscription to a publication, and to those of your friends who are interested in motoring subjects, a gift of the

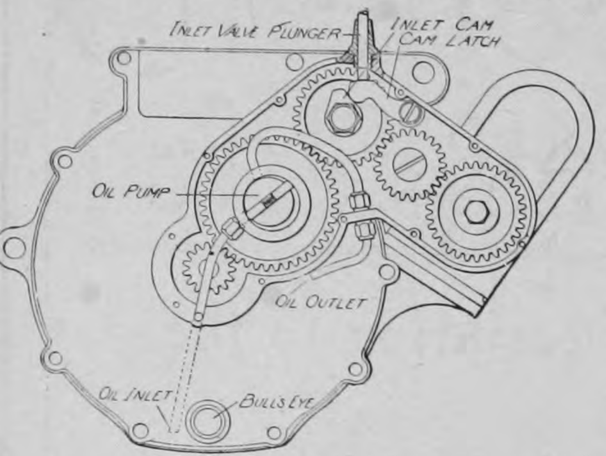
CYCLE AND AUTOMOBILE TRADE JOURNAL
(Published in Philadelphia)

for a year would be a timely courtesy, which, no doubt, would be greatly appreciated. The same amount of money spent for any other form of gift would probably seem insignificant, but a subscription to a good publication which deals with the subject in which the recipient is especially interested is a lasting reminder of your good will. Write for special Certificate and rates.

CYCLE AND AUTOMOBILE TRADE JOURNAL
Market & 49th Sts.
Philadelphia, Pa.

vers both trains of gears can be gotten at.

The roller bearings are exceptionally arge, and consist of 12 rollers to each earing. The crank pin bearing is of ex-ctly the same construction except in size. t is slightly smaller in diameter, and 11 nstead of 12 rollers are used.



ear Trains and Oil Pump arrangement of the 4 H. P. M. M. Motor.

The oil is confined in the bearing and rom the outside of the crank case in a most imple and ingenious manner. An oil ring s it is called, having a deeply concaved iner surface, is placed just outside the earing proper. An oil duct leads the sur-

new models. They afford greater elasticity to withstand road vibration, and save just a trifle over three pounds in weight. Many other detailed improvements are shown. In the 4 H. P. Magneto Single the gasoline tank has a one-quart compartment at the rear end with a separate valve. This is for use as an emergency tank.

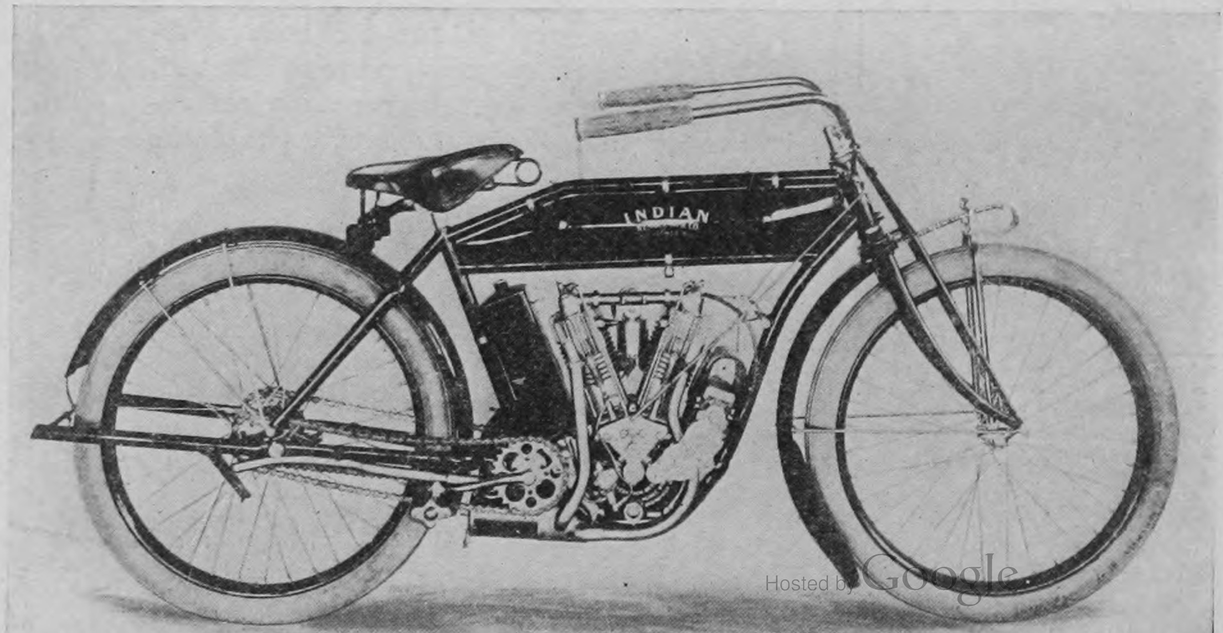
The three models can be had in either flat of V-belt drive and are listed as follows: 3½ H. P. Battery Special, $200.00; 4 H. P. Magneto Single, $225.00; 7 H. P. Magneto Twin, $300.00.

FREE ENGINE CLUTCH.

As an extra the American Motor Co. will furnish a "free engine" clutch at an additional cost of fifteen dollars. The clutch is contained in the engine pulley, and is made for either flat or V belt drive. It consists simply of an expanding steel band that turns integral with the engine shaft, and a freely movable outer shell that provides the pulley surfaces. By means of a single vertical rod with a handle lever at its upper end, and a short lever at the bottom, an in and out motion is made to expand or contract this steel band so that the engine drives the rear wheel or runs "free" of the driving pulley.

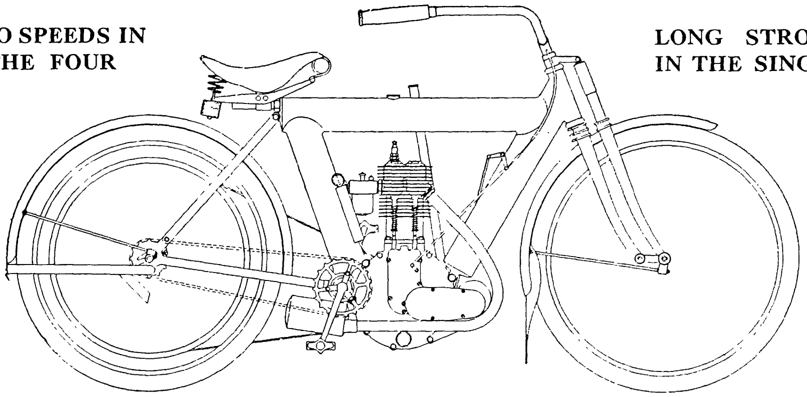
The 1910 Indians

For the coming season the Hendee Mfg. o., of Springfield, Mass., is marketing our models; 2 single cylinders and two wins. The most notable change that is ound in the 1910 Indian is the new fork onstruction, a detailed view of which is given herewith. The new fork is of the cradle spring type and is made without joints, of very heavy construction and thoroughly reinforced. A pair of strong braces extend from the lower extremity of the fork to the upper part of the steer-



First 1910 Announcement

Pierce Motorcycles



TWO SPEEDS IN THE FOUR

LONG STROKE IN THE SINGLE

FOUR CYLINDER

Our Four Cylinder Motorcycle for 1910 is considerably in advance of the 1909 Model. The most notable improvement is the addition of the two-speed and free engine contrivances. Sliding gear transmission with shaft and gears is used. More horsepower and even greater simplicity than in last season's Model. Improved oiling system and several minor changes.

SINGLE CYLINDER

After much experimenting we are offering to the trade for 1910 the first Pierce Single Cylinder Motorcycle. It is as carefully constructed as the Four Cylinder, but on account of the simpler motor and transmission we are able to offer it at a price that will compete with all other Single Cylinder Motorcycles. Pierce design and quality throughout. More than usual horsepower. Remarkable for smooth and efficient running.

The Pierce Agency for 1910

Is an asset well worth having. If you are a dealer, regularly in business, we invite correspondence on our proposition: "The Agency that Pays."

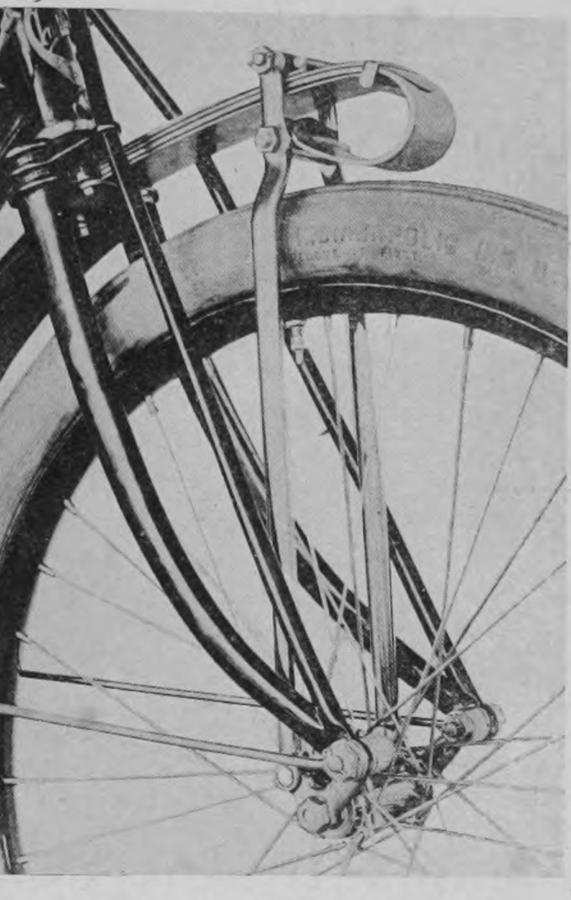
1910 Advance Catalogue Now Ready

Sent to anyone on request.

The Pierce Cycle Company :: Buffalo, N. Y.

PACIFIC COAST BRANCH—Oakland, Cal.

nnected to the fork ends, while the her arm of the lever is pivoted to a



Detail view of the 1910 Indian front fork.

ir of rods, which extend upward and con- ct with the spring. The spring is ade of highly tempered vanadium steel nbodying great strength. The bell crank hich carries the wheel, is swung to the ar thus resulting in a remarkably smooth otion in the direction in which the road ocks act, thus avoiding any tendency ward twisting of the wheels. Provisions e made for properly lubricating the joints the bearings.

Another new feature in the 1910 ma- ine is an automatic oiler of the force d type. This device sends an accurate- adjusted stream of oil into the inter- of the motor, thus insuring a contin- ous and ample supply of fresh oil which es not depend upon the judgment or emory of the rider. A hand pump is o provided as heretofore, but merely a matter of convenience for adding an ditional quantity of oil under special cumstances or for refilling the crank se after the spent oil has been drawn .

A stand has also been fitted to the 0 models, which although not new in nciple, has been fitted in an improved is set up on the stand the bracket takes a bearing on a substantial stud brazed to the rear fork, thus giving a very solid support. The attachment on this stand, being entirely separate from, and in front of the rear axle, the rear wheel can be removed entirely from the frame, which is so placed as to be entirely clear of all of the rear wheel adjustments.

Magneto ignition is the standard for the 1910 models, it having been found by experience, that this system has proven the most efficient and is practically absolutely free from trouble or necessity of attention. The 1910 machines will also be provided with a free engine and two speed gear if desired. In this device the clutch is a real clutch with positive action, giving a perfect free engine, while all of the parts are of ample proportions and strength to insure reliability and durability.

The first of the single cylinders is the regular 2¾ H. P. machine similar to that heretofore built, but including the improvements described in foregoing paragraphs. The other single cylinder is practically a new model of 4 H. P. The new machine has a cylinder of 3¼ inch bore x 3 43-64th inch stroke, giving it a piston displacement of 30.46 cubic inches. The smaller of the twins is the same as last year's twin, namely the 5 H. P. The other twin is the 7 H. P. of 60.92 cubic inches piston displacement.

The prices of the 1910 Indians are as follows: 2¾ H. P., single cylinder, magneto ignition, $225, 4 H. P., single cylinder, magneto ignition, $250, 5 H. P. twin cylinder, magneto ignition (only), $275, 7 H. P. twin cylinder, magneto ignition (only), $325. The two singles are also furnished with battery ignition if desired at $25 less price charged for magneto ignition.

The University of Pennsylvania Motorcycle Club recently held its first meeting. William Deshler Warner was elected president; H. D. Hueber, vice president, and E. R. Wilson secretary-treasurer. The new club is planning for a southern trip to Baltimore, Washington and Richmond, to be conducted Easter week.

C. W. Kennard, of Mechanicsville, Md., a non-resident member of the Baltimore Club, recently returned from a 2,030 mile tour on his twin Indian. On his trip Kennard averaged nearly 150 miles a day, passing through Washington, Baltimore, Philadelphia, Jersey City, New York, Albany, Syracuse, Auburn, Rochester, Batavia, Buffalo, Niagara Falls, Cleveland,

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Talk No. 3

To The Live Agents In All Unoccupied M. M. Territory

We've talked about our 1910 models, not much, just enough to assure you that the new M. M. is **the very best machine you have ever seen.** There is more value in it, more motorcycle for a dollar, than you have ever seen sold for 100 cents. It is a machine with the question and doubt left out; a machine that we, and you, can sell with a guarantee that **it will give perfect satisfaction** to the man who buys it.

The 1910 M. M. is the motorcycle you can sell at a profit. There will be a demand for it — simply because every man who can recognize motorcycle value will see it sticking out all over the M. M. It is a motorcycle that will sell at a low selling cost; that will stay sold because it is satisfactory, that will sell others because it is good — **good all the way through.**

We've told you about our $35,000 advertising campaign. Every dollar of it is going to help you **directly.** This amount will be spent in the magazines and newspapers. It does not include a considerable quantity of the long green we shall spend for catalogues, circulars and other matter of similar nature.

We have completed our plans for supporting our agents in every possible way this year. There will be no kick coming over deliveries. M. Ms. will be coming through in November — **and in quantities in December.** We have parts on hand and shipments will go forward promptly. We have a very helpful campaign of selling suggestions that we shall submit to you from time to time. Our follow-up system has been greatly improved, and inquiries we receive from any agent's territory **will be worked up to the sales point and then turned over to him.**

All these things we are doing to help our agents—and ourselves incidentally. The very fact that our agents all over the country are renewing their contracts with us year after year is the best evidence that our efforts are bringing returns. And we are constantly bettering those efforts.

We have put the proposition up to you very squarely. Our machines are **all we claim** for them — and then some. Our advertising in the magazines **will help.** Our follow-up system **does help.** Our circularizing, and our little monthly magazine, "SPARKS," accomplish wonders.

We are in business to stay, to make some money — and we can **show you** how **you can make money** in the motorcycle business.

It is up to you. If you are a good salesman in the bicycle, sporting goods or automobile business **we can show you why** it is profitable to add motorcycles to your present line. Write us now. Our proposition is a good one.

AMERICAN MOTOR COMPANY

716 Centre Street, Brockton, Mass.

DISTRIBUTING STORES:

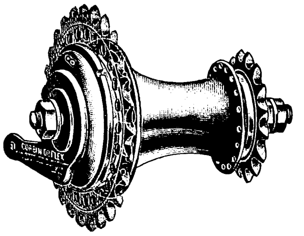
American Motor Company, 218 Clarendon St., Boston, Mass.; Geo. P. Jenkins, 10 W. 60th St., New York City; L. E. French, 895 Main St., Buffalo, N. Y.; G. M. Greene, Mgr. Am. Motor Co., 1536 Michigan Ave., Chicago. Ill.; American Motor Co. of Texas, M. M. Building, Dallas, Tex.; Lincoln Holland, 1034 So. Main St., Los Angeles, Cal.

P. S.—Write for the November issue of "SPARKS" if you are not already on the mailing list. It contains the full description of 1910 M. M. models.

Ask for Corbin

¶ Built throughout for motorcycle use. Inside diameter of brake drum, 3 inches, with shoes ½ inch wide, giving more braking surface than any other coaster brake.

Corbin Motorcycle



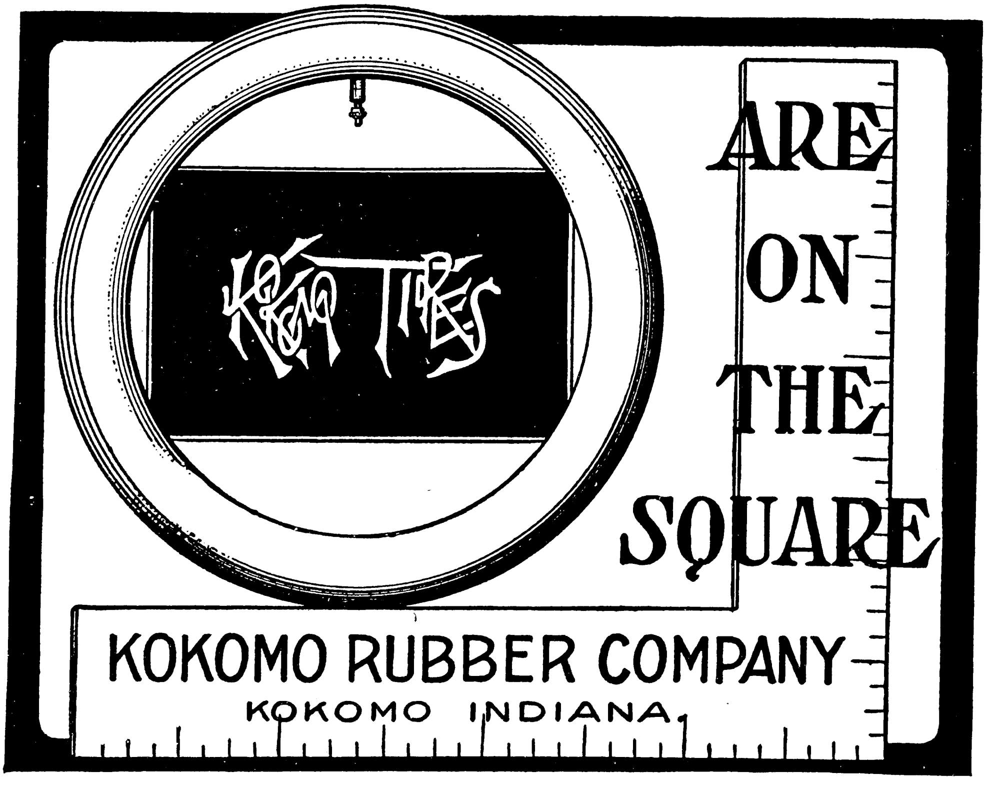
Coaster Brake Model 9

¶ Made for either chain or belt drive motorcycles, with any size sprocket, either $\frac{5}{8}$ or 1 inch pitch. Heavy knock-out axle, front hub to match.

Licensed Coaster Brake Manufacturers:

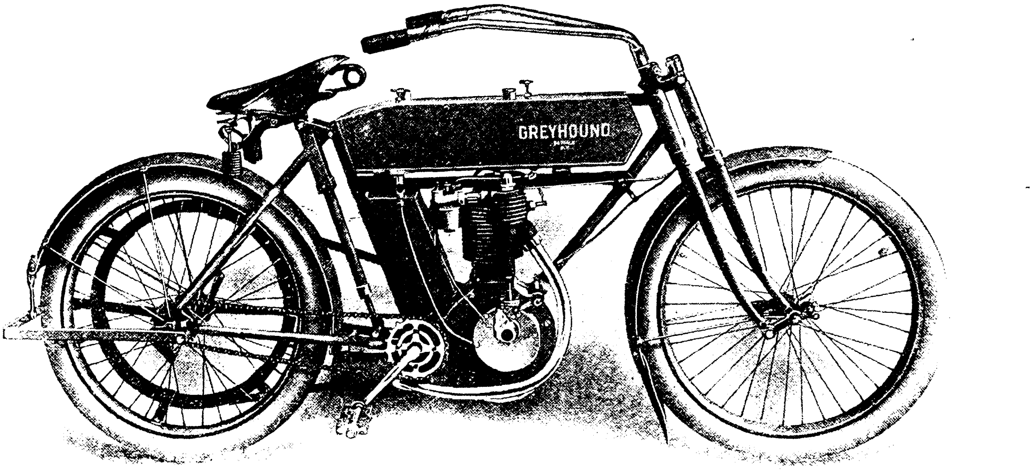
The Corbin Screw Corporation, New Britain, Conn.
The Corbin Screw Corporation of Chicago, Ill.
107-109 Lake Street

WAREHOUSES:
New York, 106-108-110 Lafayette St. **Philadelphia, Cor. 8th and Arch Sts.**



KOKOMO RUBBER COMPANY
KOKOMO INDIANA

1910 GREYHOUND



4½ H. P., large fly-wheel in oil-tight aluminum case, double grip control, V or flat belt, combination tank for gasoline, oil, batteries and coil, **The Greyhound Shock Absorber** and cushion front fork, the greatest of all the comfort devices. Large tool box; wheels, 28 x 2½. Fine lines, best material and workmanship.

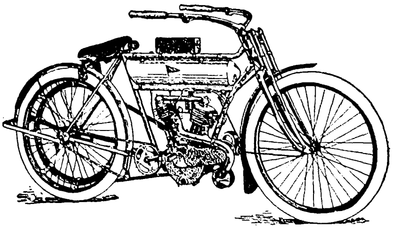
Send for full details. Proper inducements to proper agents.

GREYHOUND MOTOR WORKS :: 1453 Niagara St. :: Buffalo, New York

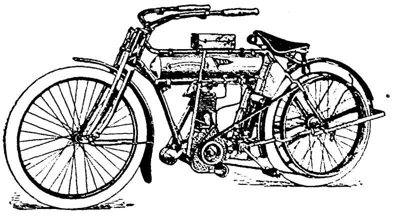
Member Motorcycle Manufacturers Association

SALES AGENTS:—Metropolitan District—The Brown-Dewey Co., 1697 Broadway, New York, N. Y. Chicago District—Whipple, "The Motorcycle Man," 260 W. Jackson Blvd., Chicago, Ill.

1910 YALE MOTORCYCLES
ARE BEING DELIVERED



6½ H. P. TWIN
S. G. V. belt. Bosch magneto,
$300.



3½ H. P. SINGLE
Flat belt and idler, battery ignition,
$200 S. G. V. belt optional.
Herz magneto, $35 extra.

¶ The Yale Motorcycle holds the **World's Record** for **Endurance,** and has **made good** in every test, no matter how severe.

¶ The Yale Motorcycle is operated at less **upkeep expense** than any other.

¶ The Yale Motorcycle is ideal for touring and business, because it runs **all the time** and **is free from trouble.**

¶ The Yale Motorcycle agency proposition for 1910 is very **attractive.**

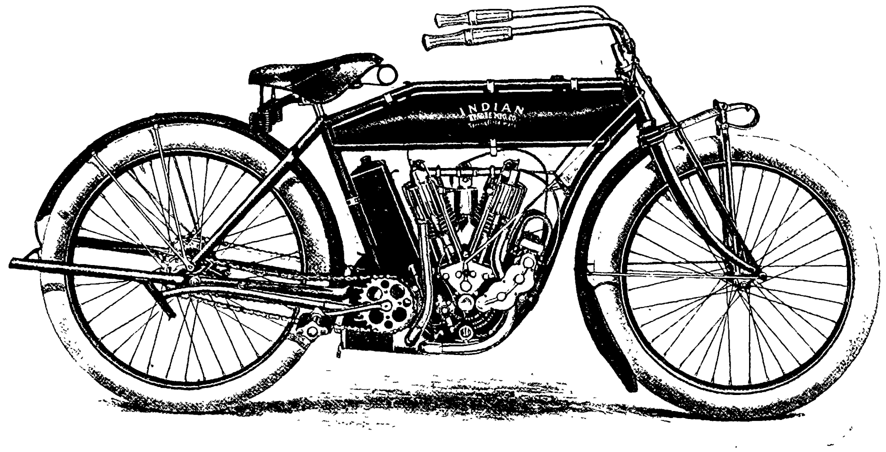
IMMEDIATE DELIVERIES. WRITE FOR INFORMATION.

"RIDE A YALE, THEY NEVER FAIL"

The Consolidated Mfg. Co., 1710 Fernwood Ave., Toledo, Ohio

We also make Yale and Snell Bicycles, Consolidated Package Cars, Hussey Handle Bars
and Drop Forgings of every description

1910 INDIANS



HAVE ALL the latest advanced features in Motocycle design. Cradle Spring Forks; Automatic Mechanical Oiler. Other Refinements of Perfection.

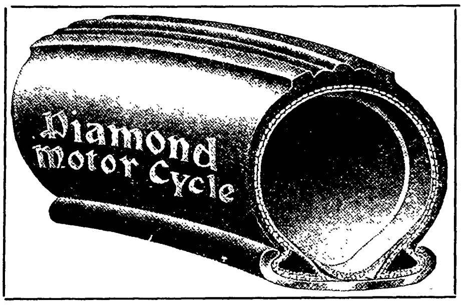
Advance Catalog F Ready

HENDEE MANUFACTURING COMPANY, Springfield, Mass. (Member M. M. A.)
Chicago Branch, 1251 Michigan Ave., London Branch, 184 Gt. Portland St.

Long Life and Large Mileage

Also SAFETY

The Keynote of the Introduction of



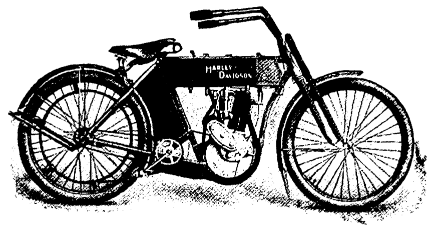
Diamond

Motor Cycle Tires
Casings and Tubes

Of Equal Merit with Diamond Automobile Tires and worthy of the name

The Diamond Rubber Company, Akron, O.

NEW SPECIAL CATALOG ON REQUEST



THE STOCK MACHINE IS THE MOTORCYCLE THAT COUNTS, and the

HARLEY-DAVIDSON

has conclusively proved that it is without an equal in this class.

Some Recent Stock Machine Victories:

Milwaukee, Wisconsin, September 25th
Fort Collins, Colorado, September 29th
Norton, Kansas, September 30th
Milwaukee, Wisconsin, October 2nd.
} WON EVERY RACE ENTERED

HARLEY - DAVIDSON MOTOR COMPANY
MILWAUKEE, WIS.

"Wouldn't Take a *Thousand Dollars* For His Curtiss Motorcycle"

Altoona, Pa., May 28, 1909.
Herring-Curtiss Company,
Hammondsport, N. Y.

Gentlemen:

Machine arrived in fine condition. I have had three different makes in my time and must say that your machine for Power, Speed, Hill Climbing and Easy Starting can never be beaten. I am more than pleased with this little steed of steel, and would not take *One Thousand Dollars* for it to-day, if I couldn't get another one.

Thanking you for your prompt and courteous attention given my order, I am,

Yours very truly,
A. M. CONRAD.

This is but one of hundreds of similar unsolicited testimonials received from Curtiss riders.

Every Curtiss motorcycle is just as good as this one.

Write for Agency Proposal to-day.

HERRING-CURTISS COMPANY
Hammondsport :: New York
New York Distributor:
CURTISS MOTORCYCLE COMPANY
1203 Bedford Ave., Brooklyn, N. Y
Pacific Coast Distributor:
G. A. FAULKNER
351 12th Street Oakland, Cal.

N.S.U.

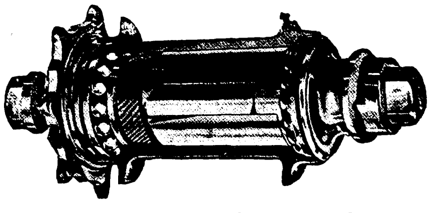
MOTORCYCLES
DELIVERY VANS
SIDE & FORE CARS

With an N. S. U. you can put all thoughts of roadside troubles to one side—they never occur. You need have no fear of heavy running expenses. You have a motorcycle which has earned a world-wide reputation for reliability, efficiency and strength. You can buy no better at any price.

THE DEALER, THE RIDER, GET CATALOGUE "A"

N. S. U. MOTOR CO., 206 West 76th St., New York City

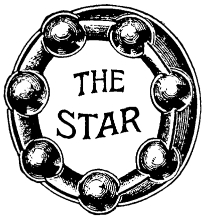
YOU SEE THEM EVERYWHERE



The Eclipse Coaster Brake

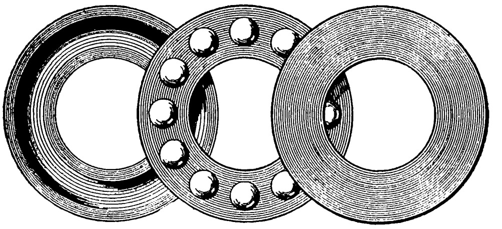
is the equipment on the majority of bicycles and motorcycles, because it is simple, highly efficient and satisfactory. Are your 1910 machines so equipped? If not, better get particulars and prices.

Eclipse Machine Company, Elmira, New York

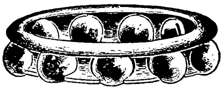


THE STAR BALL RETAINER CO.

Lancaster, Pa., U.S.A.

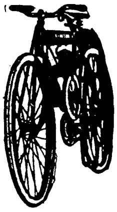


Complete Thrust Bearing



Radial Retainers

Manufacturers of Radial Ball Retainers, Thrust Ball Retainers, Complete Thrust Bearings, Special Stamping, etc.



BARGAINS

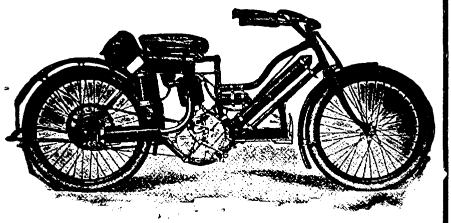
If you have not sent your name in for our big accessory catalog you have missed a good thing and lost $ $.

About half the riders in America buy parts from us because all are guaranteed and the prices are the lowest. We have the largest accessory stock in America. Send postal to-day for catalog A.

MOTORCYCLE EQUIPMENT CO.
Hammondsport, N. Y.

NEW ERA AUTO-CYCLE

TWO SPEEDS, FREE MOTOR, HAND-CRANKED MOTOR



The New Era Gas Engine Company
7 Dale Avenue, Dayton, Ohio

Have You Seen the

MOTOR CYCLE, MOTOR BOAT & AUTOMOBILE TRADE DIRECTORY

(Published in Philadelphia)

It is worth more than other directories which cost five times as much.

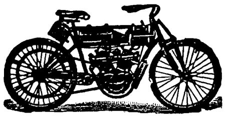
Sample copies sent free on request to anyone in the automobile industry.

Single copies - 50c.

1 year - - $1.00 5 years - - $4.00

CHILTON PRINTING CO.
Market and 49th Sts., Phila., Pa.

GEER MOTORCYCLES



5-H. P. 2-cylinder GREEN EGG	$225.00
4-H. P. BLUEBIRD - - -	200.00
2½-H. P. GEER Model 4	150.00
Used motor-cycles - - -	40.00

We have the largest line of new and used motorcycles in the country at the lowest prices. Every machine guaranteed. Repairs a specialty. Motors and castings for air-ships. Motors for railway velocipedes. Send for catalogue.

HARRY R. GEER CO.
856 McLaran Ave. St. Louis, Mo.

Torpedo Motorcycles

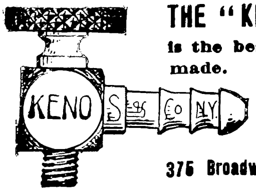
WHY HESITATE? Unless you ride the BEST you cannot be a SATISFIED MOTORCYCLIST. You know there can be but one BEST and that is the TORPEDO. Write for catalog and agent's terms.

The Hornecker Motor Mfg. Company
Geneseo, Ill., U. S. A.

Motorcycle Accessories

Send for largest and most complete catalogue ever issued. **Indian & Harley-Davidson Motorcycles, $50 Up.**

F. B. Widmayer Company, 2312 Broadway
New York City



THE "KENO CONNECTION"

is the best pump nipple ever made. One sample for 15c.

Stevens & Co.
375 Broadway, New York City, N. Y.

SPROCKETS

for Bicycle and Motorcycle

WE MAKE 90 PER CENT OF THE SPROCKETS USED

THE PARISH & BINGHAM CO.
Cleveland, Ohio

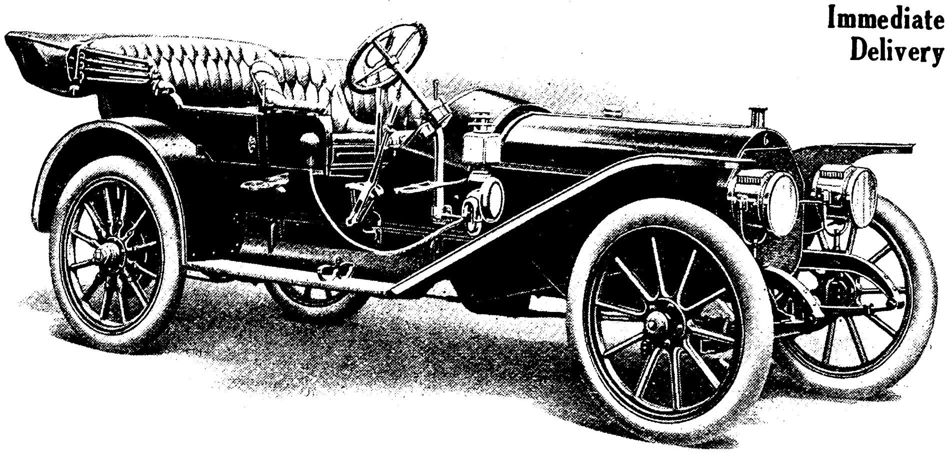
100 Per Cent. of Satisfied Customers

"Matheson"

Licensed Under the Selden Patent

1910 Six-Cylinder 50 h. p., $3,000 Equipped with choice of toy tonneau, touring, runabout, tourabout, or close-coupled bodies

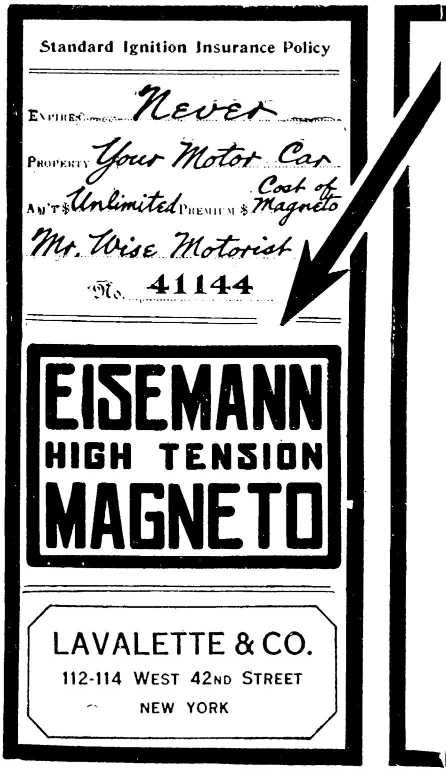
Immediate Delivery



The Matheson Six is the swiftest, the most economical in fuel consumption and tire wear, the most comfortable, the most thoroughly mechanical and the handsomest six-cylinder car on the market, regardless of price. This is our guarantee. You are the judge.

Also the 1910 Matheson Four, the very finest of all four-cylinder cars, immediate delivery of Touring Car, $5,000, Toy Tonneau, $4,750, and Limousine or Landaulet, $5,750.

MATHESON AUTOMOBILE CO., Main Sales Office, 1886-1888 Broadway, N. Y. City



Standard Ignition Insurance Policy

EXPIRES Never

PROPERTY Your Motor Car

AM'T $ Unlimited PREMIUM $ Cost of Magneto

Mr. Wise Motorist

No. 41144

EISEMANN HIGH TENSION MAGNETO

LAVALETTE & CO.
112-114 WEST 42ND STREET
NEW YORK

AN

Ignition Insurance Policy

is held by every user of an

EISEMANN MAGNETO

The EISEMANN MAGNETO ends ignition troubles. It assures you a motoring trip free from the usual annoyances and discomforts. It is absolutely dependable at all times.

Ask us for further fac's

LAVALETTE & COMPANY
112-114 West 42d Street - NEW YORK

It's Service You Want from a Sparking Battery—Long Service

Therefore the best is the cheapest, because a long life makes the price low.

The "Exide" Sparking Battery is made by the largest and the most responsible battery maker—The Electric Storage Battery Co.

For 21 years they have always been the leader in battery building and their product ranks so high that they do the bulk of the entire battery business of the country. ***That tells the story.***

BUY WHAT THE EXPERTS BUY

The "Exide" Sparking Battery

"Exide" Sparking		"Exide" Duplex Sparking	
6-40, List Price, $20.25	14 other sizes	Main 6-40, Emergency 6-5	List Price, $28.50
6-60, " " $25.25	from $7.75 to $46.75	" 6-60, " 6-5	" " $33.50

An interesting and attractive illustrated booklet, telling all about the manufacture of "Exide" Sparking Batteries has been printed for you. It includes three special articles written by the editors of "Cycle and Automobile Trade Journal," "Motor" and "Automobile." Send for it.

THE ELECTRIC STORAGE BATTERY CO. 1888 1909

PHILADELPHIA, PA

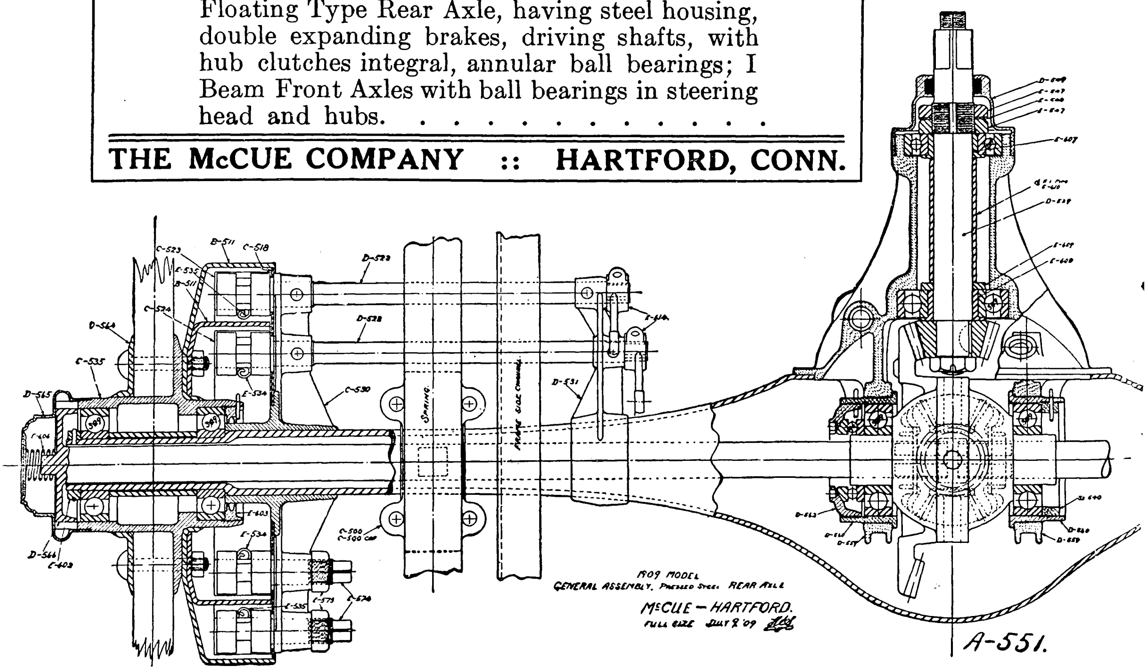
New York Boston Chicago St. Louis Cleveland Atlanta San Francisco Toronto

715 Distributors throughout the United States. Write for the name of the Distributor nearest you.

Automobile Axles

Floating Type Rear Axle, having steel housing, double expanding brakes, driving shafts, with hub clutches integral, annular ball bearings; I Beam Front Axles with ball bearings in steering head and hubs. . . . .

THE McCUE COMPANY :: HARTFORD, CONN.



The Story of an Electric Test

A manufacturer that makes both gas cars and electric vehicles wanted a practical test of the relative merits of the two cars for city driving and shopping ; so he sent out his best chauffeur with a gas car and also one of his stenographers in an Electric.

Both were asked to make twenty stops of ten minutes each in the centre of the city, and see who could make the trip and return in the shortest time.

The girl in her electric reported twenty minutes quicker than the expert did in his big gas car.

That's Why Electrics Are Coming Fast

Their business has largely increased this year over last, and by actual count nine out of every ten are equipped by the manufacturers with

The "Exide" Battery

All the following prominent Vehicle Manufacturers can supply you with the "Exide" Battery.

Baker Motor Vehicle Co.
S. R. Bailey & Co., Inc.
Broc Carriage & Wagon Co.
Champion Wagon Co.
Columbus Buggy Co.
Couple Gear Freight Wheel Co.
Columbia Motor Car Co.
General Vehicle Co.
C. P. Kimball & Co.
Rauch & Lang Carriage Co.
Studebaker Automobile Co.
The Waverley Co.
Woods Motor Vehicle Co.

Buy What The Experts Buy

The "Exide" Battery is the result of 21 years' experience of the oldest-largest maker of storage batteries in America.

Besides a Research Laboratory to advance the quality of storage batteries, and in order to insure the uniform quality of the battery output, this Company maintains two separate laboratories.

In one, is tested the purity of all raw materials.

In the other is tested samples from each day's manufactured product.

By such care has the business grown steadily these 21 years to its present proportions.

Prompt shipments from large stocks in Philadelphia, Boston, Cleveland, Chicago and San Francisco.

Send us your name on a postal today for the "Exide" Battery Booklet. New facts about Batteries. Keep up-to-date.

THE ELECTRIC STORAGE BATTERY CO. 1888 1909
PHILADELPHIA, PA.

New York Boston Chicago St. Louis Cleveland Atlanta San Francisco Toronto

715 Distributors throughout the United States
Write for the name of the Distributor nearest you

The Houpt Car

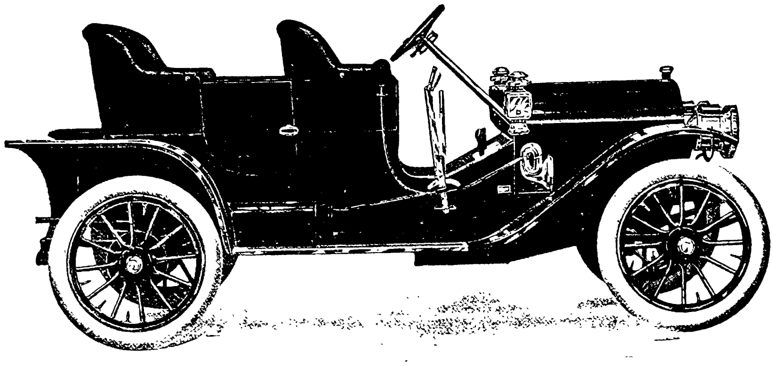
4 cylinder, 60 horsepower, costing $5000, is now ready for delivery
6 cylinder, 90 horsepower, costing $6000, will be ready in October

The Houpt car represents five years' persistent experimentation and combines the experience of two decades in the development of motor cars. It is the highest expression of automobile engineering, the final word in motor car construction.

Harry S. Houpt Mfg. Co.

BRISTOL, CONN. 68th & Broadway, N. Y. CITY

Now prepared to assign territorial rights throughout the United States



Dorris Close Coupled Car
Price, $2500

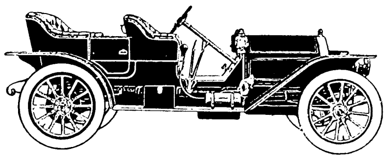
Equipt with

Tools
Speedometer
Tire Carriers
Five Lamps
Prest-O-Lite Tank
Brass Folding Shield

Dorris Motor Car Company :: St. Louis, Mo.

National

$2,500 **"40"**



Costly Construction

EVERYBODY "in the know" of the Automobile recognizes this as the big bargain of the year. Not a little car with a big rating, but a big car with a low rating. Think of it! A big car with cylinders 5x5$\frac{11}{16}$, with 36″ wheels, with a wheel-base of 124 inches, with Bosch magneto and storage battery, with the finest materials and workmanship in the world throughout at **$2,500!** A car that beats a mile a minute on circular tracks—a car that is big, powerful, luxurious and capable in the highest degree for such a price! It's the best value of the year.

PARTIAL SPECIFICATIONS

Motor—Four cylinder, 5x5 11-16 inches vertical, cast in pairs. Water-cooled; centrifugal pump. **Clutch**—Self-contained aluminum, cone leather faced, spring cushioned. **Transmission**—Sliding gear, selective type. Three speeds forward and reverse. **Wheel base**—124 inches. **Drive**—Bevel gear, through propeller shaft. **Oiling**—Crank case, constant level force feed oiler, oiling all working parts of motor. **Ignition**—Two separate complete systems. One a gear-driven, high-tension Bosch magneto. The other a storage battery, single coil and distributor. Each system has a separate set of spark plugs. **Tires**—36x4. **Gasoline Capacity**—20 gallons. **Brakes**—Two systems. Two internal expanding metal to metal hub brakes and two hand brakes on outside of rear wheel drums. **Front Axle**—I-beam steel forging. **Rear Axle**—Compound construction: inner axle used only as a driver. **Body**—Straight line. Carrying capacity, five passengers. **Springs**—Half elliptic, 40-inch front under frame, 48-inch rear, ¾ scroll elliptic. **PRICE, $2,500.**

NATIONAL SIXES

"Fifty"—Six Cylinders, 4½x4¾	-	**$4,200**
"Sixty"—Six Cylinders, 5x5	- -	**$5,000**

Type of Body—Touring, Baby Tonneau or Roadster—optional on all National Cars.

National Motor Vehicle Co.
1003 East 22nd St., Indianapolis, Ind.

How to Choose The Right Car

II

The Brakes

IF your car refuses to stop — that's disaster. You don't want any uncertainty—on that point. The way to stop a car is by the use of liberally designed brakes. In selecting a car, after the agent has shown you a nice new car on the exhibition floor, and has taken you out in his "demonstrator," give the demonstrator a look over, and look at and feel of the brake-bands.

Try this cautiously on some makes of cars, for you may burn your fingers. And if you see blistered paint on the bands, thank the agent kindly, and — look further. Investigate

Glide

Cars for 1910

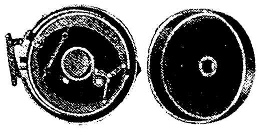
Brakes are all-important. They must not only grip and hold the car — most of them do that. But they must be capable of gripping continuously while the car is moving, on long hills, without burning up the brake-band. And the way to prevent this is to make them large enough.

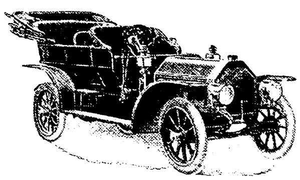
Here is the *Glide* Emergency Brake — one of the strong features of Glide Cars.

Sixteen inches in diameter and three-inch face; gripping without on the band, and within on expanding shoes. It is fastened to the spokes of the wheels, and the braking strain is transmitted directly to the brake without needlessly passing through the axle.

It grips actually, or retards gradually, and stays cool. Every part of the Glide Car will stand the same searching analysis.

We want you to investigate the new Glide Models for 1910. They're what an automobile should be. Write for the facts.





The Bartholomew Company
210 Glide St.
Peoria, Ill., U.S.A.

Automobile Tires

Clincher and Quick Detachable

All New Goods, all High Grade Makes. Small Ad, Small Prices. Money Refunded at once if dissatisfied on receipt of goods. We are not going to tell you that we have contracts with Factories, for they are well able to sell their goods themselves. Our PRICES do the talking. Your money refunded, provided you do not use the goods. Before buying elsewhere let us give you expert information on tires. We are in the business 15 years. Even if you don't buy from us we will be glad to correspond with you. Will give you the best of our advice.

	Shoe	Tube
28 x 2½	$ 6.50	$2.00
30 x 2½	6.00	2.00
28 x 3	9.50	2.25
30 x 3	10.00	2.50
34 x 3	8.00	2.00
36 x 3	10.00	2.00
30 x 3½	13.00	3.00
32 x 3½	14.00	3.50
34 x 3½	14.00	3.50
36 x 3½	12.00	3.00
30 x 4	16.50	3.50
32 x 4	17.00	3.75
34 x 4	19.00	4.00
36 x 4	17.00	3.50
32 x 4½	15.00	3.50
34 x 4½	19.00	4.00
36 x 4½	19.00	3.50
34 x 5	18.00	4.00
36 x 5	19.00	4.00

GOODYEAR, DUNLOP, MICHELIN TYPE

30 x 3½	$15.00
30 x 4	17.00
32 x 3½	17.00
34 x 3½	17.00
34 x 4	19.00
32 x 4	17.00

Special Tires to fit 30 x 3 Clincher Rims, Brand New Shoe and Tube complete, $6.50 each.

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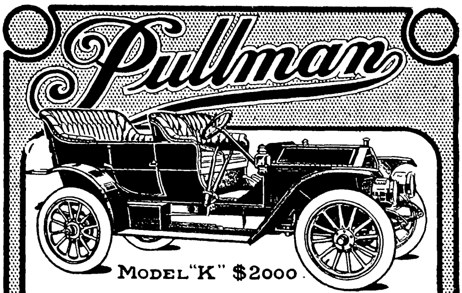
A. H. KASNER

Near Chambers Street
152 Church Street, N. Y. City
Largest Tire Dealers in U. S.



MODEL "K" $2000

Study the Car you are going to buy

Understand its vital points.

Is it built to last?

Is it economical to maintain?

Will it stand severe usage?

Is it strong as well as attractive?

Pullman cars meet these tests before leaving the factory.

"Not Only the Best at the Price, but the Best at Any Price"

Prices and Models:

F. O. B. Factory, York, Pa.

Model "K"—35 H. P. Touring Car or Roadster	$2,000
Model "4-40"—40 H. P. Roadster	3,000
Model "M"—40 H. P. 7-passenger, Touring Car	3,500
Model "O"—Light Car (to be announced later).	

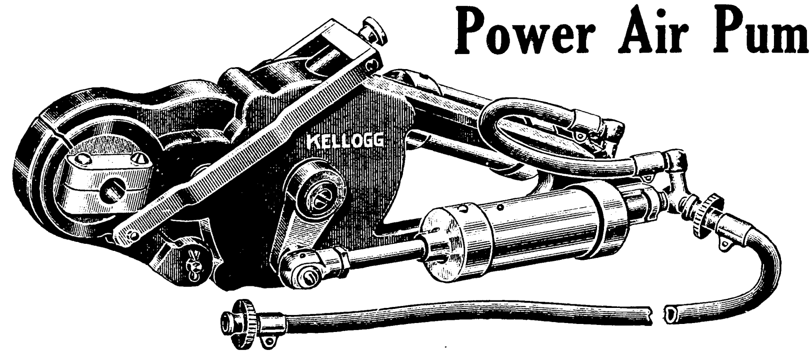
Write for Announcement of the 1910 Model "K"

York Motor Car Co., Inc.

Department H, York, Pa.

Look up our nearest agent

Kellogg Quick Detachable Power Air Pump



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and other cars having exposed shafts.

Write for particulars and price.

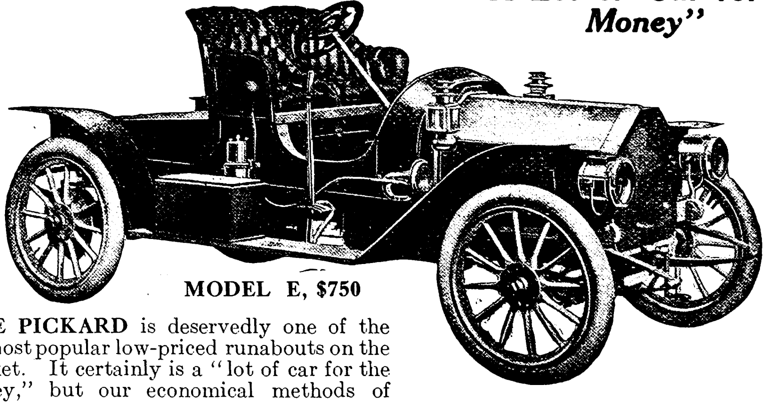
KELLOGG MANUFACTURING CO.
ROCHESTER, N. Y.

Pickard

MANUFACTURER

$750

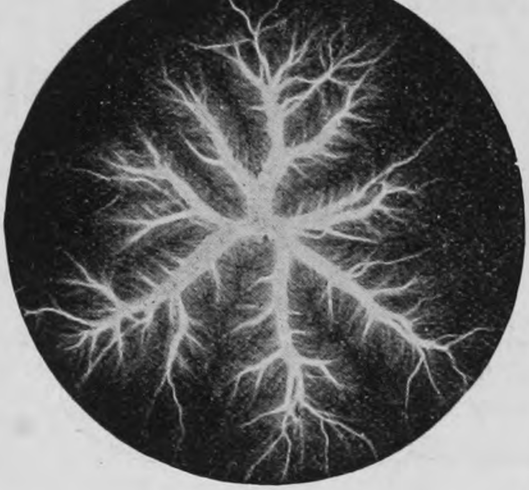
"A Lot of Car for the Money"



MODEL E, $750

THE PICKARD is deservedly one of the most popular low-priced runabouts on the market. It certainly is a "lot of car for the money," but our economical methods of manufacture allow us to give you so much real value for so small a price. We have other models, however, as follows: Model F, Rumble Seat, $800; Touring Car, Model H, $850; Surrey, Model G, $825; Model A, $1400; Model B, $1400; Model C, $1450; Model D, $1500.

PICKARD BROS., BROCKTON, MASS.



THE SPARK

That has caused a sensation in the motor world.
Cut represents a single discharge from the

Seeley High Frequency Ignition System

"The Coil Without Vibrators"

We challenge the world to duplicate it with any other system of ignition.

The Seeley System means the end of your Ignition Troubles—if you will investigate its merits—for investigation in this case assures conviction.

WHY?

Because the system is simplicity itself in construction and operation; efficient and reliable under any and all conditions; economical in first cost, as well as in saving of fuel (and patience) afterward; accurate to a degree beyond possibility with vibrator coils; productive of more power; durable, safe and convenient. In short, it is BETTER.

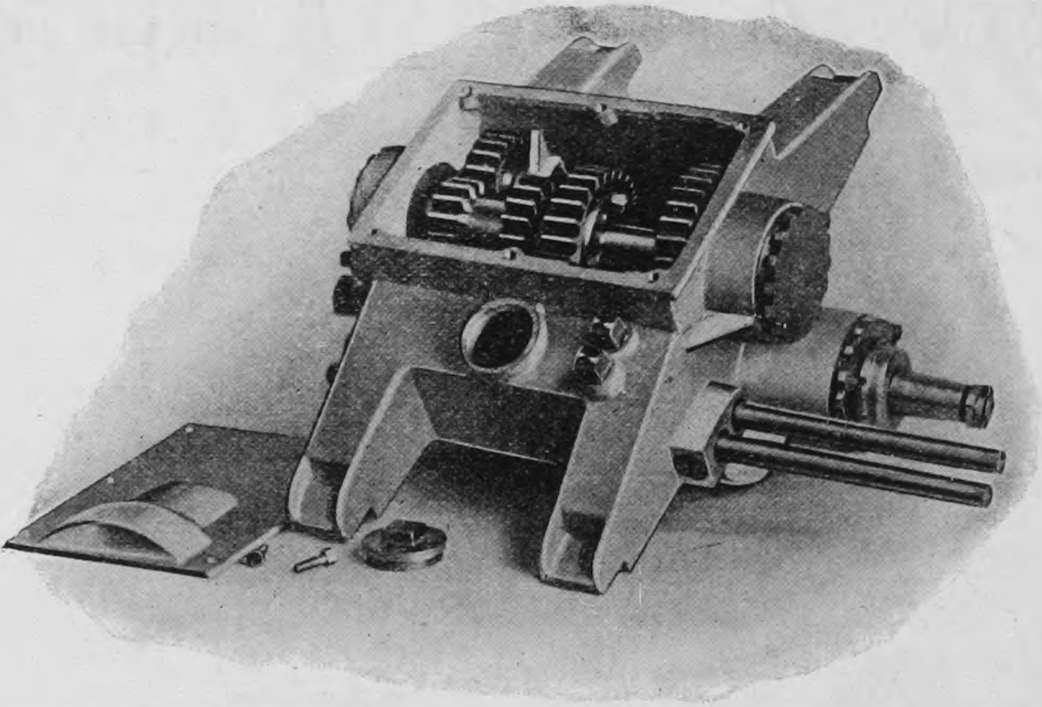
TRY IT AT OUR RISK

If we did not have implicit confidence in the ability of the Seeley System to 'MAKE GOOD," we could not afford to place ourselves on record with such a sweeping offer to thousands of prospective customers. SATISFACTION—OR MONEY BACK.

Send for our finely illustrated booklet, and let us tell you the whole story. We know you will ultimately—why not now?

High Frequency Ignition Coil Co., 2307 Main St., Los Angeles, Cal.

See Exhibit at Automobile Shows



SELECTIVE TYPE AUTOMOBILE TRANSMISSION GEARS.

STYLE 3V, 60 H. P. AND LOWER
STYLE 33V, 35 H. P. AND LOWER

Made in both vertical and horizontal types and fitted with annular ball bearings, as specified.

The gears are made of chrome nickel steel, hardened, treated and ground to size; the shifter rods are fitted with an automatic inner-lock, making it impossible to mesh two gears at one time; the rods are also

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It is just what he has been waiting for. Without a single fault and with twice as many important features, it stands prominently superior to other meters.

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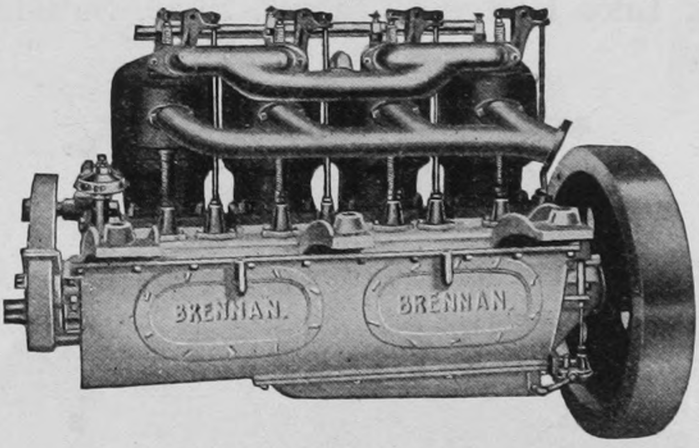
BRENNAN STANDARD MOTORS


BRENNAN.
BRENNAN.

Model "9" Vertical Motor

Built in seven sizes of the four cylinder type; and two sizes of the six cylinder type.

It is light in weight, although compact and powerful. All wearing parts are extra large, made of the very best of materials and finely finished.

MODEL "9" is fitted for double ignition systems—by spark coil and magneto. It has a bracket and shaft for fitting magneto. The lubrication is by self-contained, force-feed oiling system.

2 cylinder Motors, $4\frac{9}{16}$ x 5, 5 x 5, $5\frac{1}{2}$ x 5.

Brennan Standard Motors were one of the first on the market. With each succeeding year they have been improved until they have no equal today. You make no mistake in using **Brennan Standards.**

We also make a specialty of Transmission Gears, Planetary and Selective Type Sliding.

Let us give you further particulars and quote prices.

THE ALUMINUM CASTINGS CO.

GENERAL OFFICE
CLEVELAND, OHIO
PLANTS—Cleveland, Detroit, Buffalo, Syracuse
and New Kensington

High Grade Beaver Motors

Work Like Beavers—Silent, Sure, Satisfactory

6 Cylinder Vertical, $4\frac{3}{8}$ x $4\frac{3}{4}$

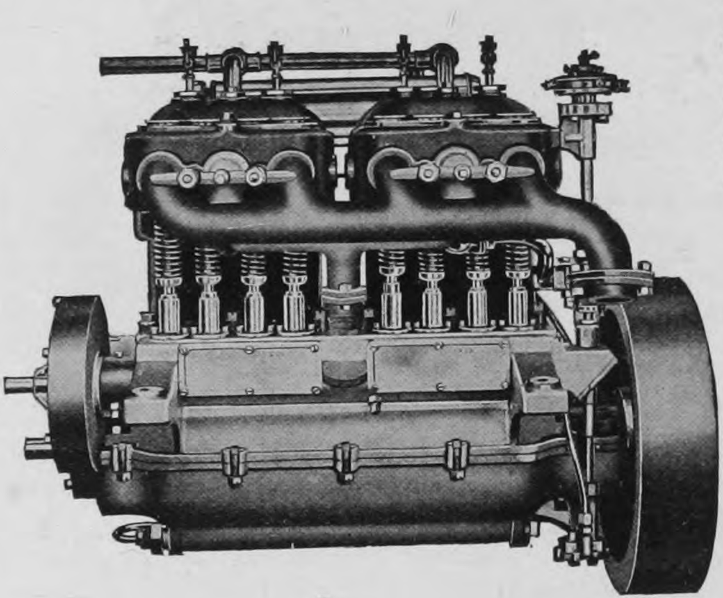
4 Cylinder Vertical, $4\frac{3}{8}$ x $4\frac{3}{4}$ and $4\frac{3}{4}$ x $5\frac{1}{4}$

2 Cylinder Horizontal Opposed, $4\frac{3}{8}$ x 4 and $4\frac{3}{4}$ x 4 & $5\frac{1}{8}$ x $4\frac{1}{2}$

4 Cylinder Horizontal Opposed, $5\frac{1}{8}$ x $4\frac{1}{2}$

Centre Crank Oiling Device

All Motors are Four Cycle



The 4 Cylinder Horizontal Opposed Motor is Designed Specially for Commercial Trucks.

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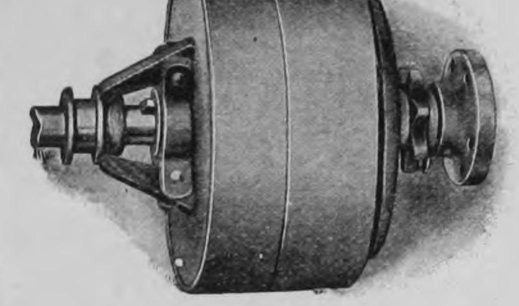


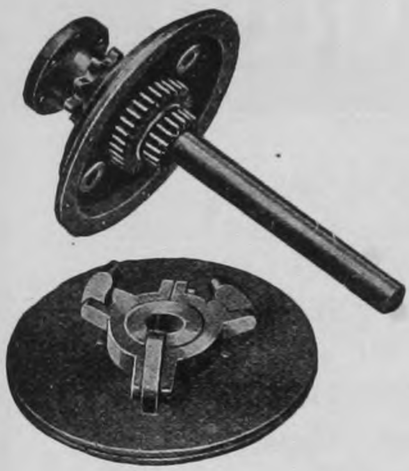
Planetary Transmissions

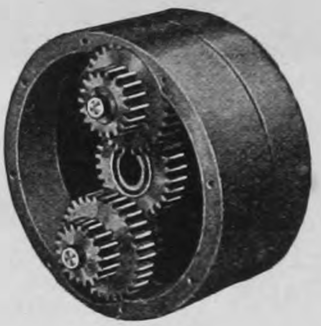
Manufactured Under
License from Patentee. (Ball Pat.)

Two Speeds Forward and Reverse

TWO SIZES
- **12 to 20 Horse Power for Light Touring Cars and Roadsters**
- **6 to 12 Horse Power for Buggyabouts and Light Runabouts**

Send for Particulars and Prices in Quantities



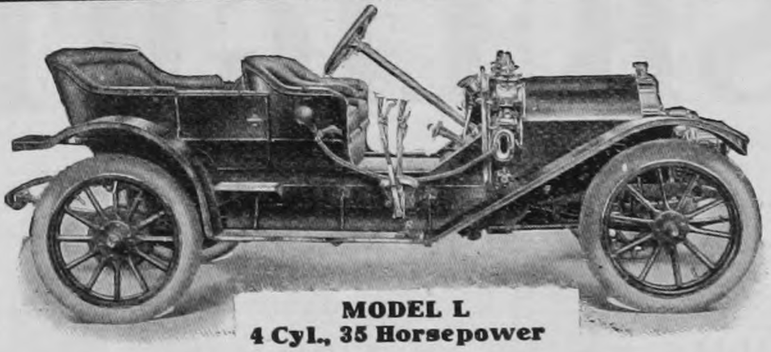


We Build

Gasoline Engines
Transmissions
Rear Axles
Jackshafts

IN QUANTITIES

MICHIGAN AUTOMOBILE CO., Ltd., Kalamazoo, Michigan



MODEL L
4 Cyl., 35 Horsepower

MIDLAND

Supreme Value for 1910

With its many new and exclusive features, the model L, 1910 Midland offers you far more for the money than any other car on he market.

Its great reserve power and perfect performance under the most trying conditions have already won for it many enthusiastic admirers amongst those who know its accomplishments.

In the Munsey Reliability run, the Model L "Midland" was a pilot car. The car had been driven 5,000 miles before the contest, and was only a stock car not specially constructed for the event; yet it covered itself with glory all the way.

In the Philadelphia-Seattle relay race—Model L "Midland" was used between Dixon, Ill., and Mt. Vernon, Ia. It completed this run of 120 miles in 4 hours and 55 minutes without a mishap. This includes time waiting for and on board ferry at Clinton, while crossing the Mississippi. Compare this with showing made by other cars making up the relay.

Model L, 1910, $1800; with Touring Car, Toy Tonneau or Roadster Body

A notable feature of this sturdy car is the unit power plant, and three point suspension. No strain or stress can destroy the perfect alignment of driving elements.

The flywheel and clutch are completely encased. This insures perfect alignment of the crank shaft, prevents unnecessary friction and results in a maximum of power being delivered to the rear wheels.

Cylinders are cast in pairs with valves on opposite sides. The lubrication system is the same as used on the highest priced cars.

The springs are ¾ elliptic rear, semi-elliptic front—standard construction.

All brakes are inside the drums, two sets on each wheel—dust proof and anti-rattle.

But these are only a few of the many points in the constructio of the Model L Midland, which give it such a smooth and powerfu action—such convincing superiority over all other cars selling at any where near its price. Write for FREE booklet and learn ALL abou this handsome Model L, 1910 Midland.

MOLINE, ILLINOI

Don't Get the WRONG Warner

WARNER MFG. Co.

T. W. WARNER, PRES. & GEN. MGR.

.. *of* TOLEDO, OHIO ..

THIS Company has no connection whatever with any other concern, either in the Automobile or parts manufacturing business, except our Muncie, Indiana, branch, the T. W. WARNER CO., manufacturing GEAR SHIFT LEVERS, TRANSMISSIONS, DIFFERENTIALS, and STEERING GEARS. Now booking 1911 contracts, but can handle a limited amount of 1910 business. $250,000.00 invested in machinery and tools. 75,000 square feet floor space. Capacity, 500 men.

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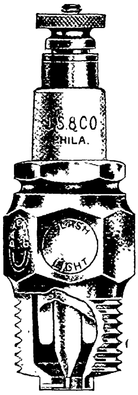

The BEST plug
for BATTERY

PLATINUM
IRIDIUM
POINTS

PRICE, $1.50

J.S.&CO.
PHILA.
FLASH LIGHT

The ONLY plug
for MAGNETO

PLATINUM
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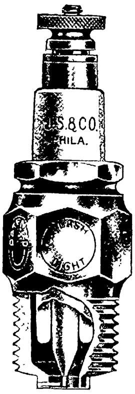
PRICE, $1.50



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SPARK PLUGS

JANNEY, STEINMETZ & CO., PHILADELPHIA

BRAKE

Thermoid

You Never Saw a Brake Once Lined With
THERMOID Which Had to be Relined

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A **complete and accurate** classified list of all the manufacturers of Motor Cars, Motor Cycles, and Motor Boats and their parts and accessories.

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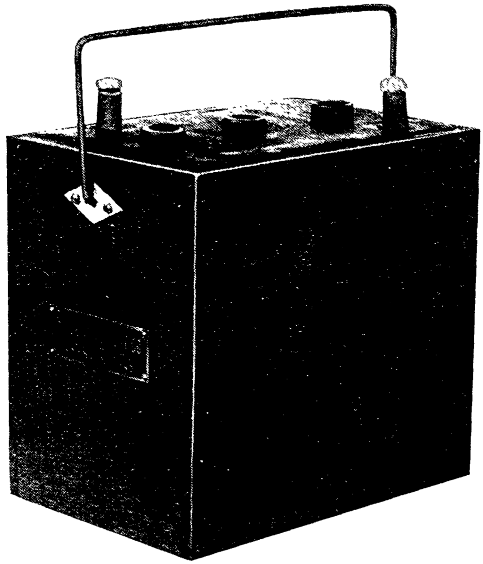
HOLD THE



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For Everything from 30 to 100 Miles

Every manufacturer, every driver knows what that means. To stand the jolts and jars and give absolutely steady, strong ignition means a battery that is

BUILT JUST RIGHT

Unit construction of course. Our patent grids are so designed that **plates cannot disintegrate.** Perfect circulation and entire freedom from short circuiting. Electric vehicles equipped with Pumpelly Batteries run longer, faster and at less expense for charging than any others. Electric lights run from Pumpelly Batteries burn longer than any others.

Ask for our little book—

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DO THE BUSINESS

Six Months' Service and Still Good

Three to five thousand miles with no rim cuts, stone cuts, glass cuts, blowouts, tack or nail punctures, no tire expense, delay or inconvenience, no fears of skidding or spinning, no tire troubles of any description, just pleasure, pure and simple. This is what WALKER AUTO TIRE BANDS HAVE DONE for the Indianapolis Fire Chief. They will do as much for you.

WHAT'S THE USE

of having tire trouble and expense when our Bands will put a stop to both ? No resilience lost, no power lost, no injury to the tires. Makes any old tire serviceable for years. Costs about half the price of a new tire and saves the necessity of carrying extra casings. **Do it now.** Don't put off till tomorrow what you ought to do today. Buy a set of WALKER AUTO TIRE BANDS at once and you will never have occasion to regret it.

Price list and descriptive circulars on application.

WALKER AUTO TIRE BAND CO.
18 to 24 S. East Street, Indianapolis, Ind.

All Alike but
STEIN
LAPLOCK
TIRES
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The Laplock Base Has Selling Advantage Over All Others

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Stein Tires are tires that every dealer needs to keep in stock. The Laplock Base gives them a distinct advantage with every buyer.

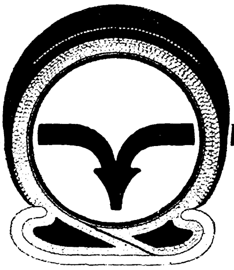
No other tire has a solid wall between the rim and inner tube.

No other tire gives absolute protection to the inner tube from "pinching," "chafing" and rotting.

In selling any other tire you can only talk glittering generalities about quality. The Stein Laplock Tire has quality equal to any; and *The Stein alone has the Laplock Base.*

The Stein Double-Cushion Tire Co.

Do not delay. Write at once for Booklet "T" and prices.



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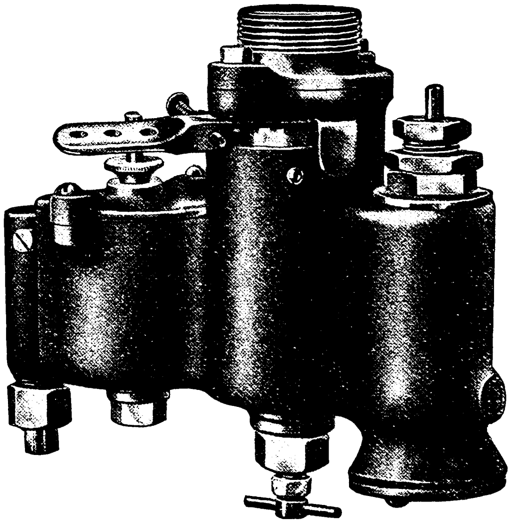
Established 1901

The Sherwood "Model K" Carburetor



Has Three Jets,

each in a separate mixing chamber and all controlled by one throttle.

Power--Flexibility

Perfect Motor Control

and Economy are

the Results and

One Gasolene Adjustment Does It

Write for Circular Giving Full Information.

Manufactured by

Sherwood Manufacturing Co., Buffalo, New York

Gas and Gasolene
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VALVES

We are specializing in the Forging of High Nickel Alloy for this purpose.

We are Succeeding—Present orders prove Material Right—Workmanship Right—Prices Right.

Ask for list and prices of over one hundred stock die sizes.

We also make Drop Forgings generally.

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ELECTRIC

You can't fully
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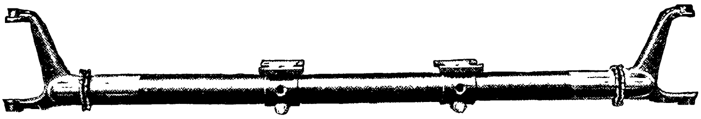
until you have given it an actual test. We have established a reputation as being the most successful company that has ever launched out into the electric welding proposition on a large scale.



We have accomplished many wonderful results, as is evidenced by our marked success, and the assistance we have been to the automobile industry. Your inquiries will be thankfully received and have prompt attention.

THE STANDARD WELDING CO.
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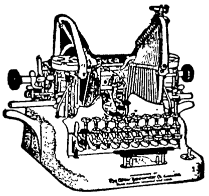
A $100 Typewriter for 17 Cents a Day!

Please read the headline over again. Then its tremendous significance will dawn upon you.

An Oliver Typewriter—the standard visible writer—the $100 machine—the most highly perfected typewriter on the market—*yours for 17 cents a day!*

The typewriter whose conquest of the commercial world is a matter of business history—*yours for 17 cents a day!*

The typewriter that is equipped with scores of such conveniences as "The Balance Shift"—"The Ruling Device"—"The Double Release"—"The Locomotive Base"—"The Automatic Spacer"—"The Automatic Tabulator"—"The Disappearing Indicator"—"The Adjustable Paper Fingers"—"The Scientific Condensed Keyboard"—all



Yours for 17 Cents a Day!

We announced this new sales plan recently, just to feel the pulse of the people. Simply a small cash payment—then 17 cents a day. That is the plan in a nutshell.

The result has been such a deluge of applications for machines that we are simply astounded.

The demand comes from people of all classes, all ages, all occupations.

The majority of inquiries has come from people of known financial standing who where attracted by the novelty of the proposition. An impressive demonstration of the immense popularity of the Oliver Typewriter.

A startling confirmation of our belief that the Era of Universal Typewriting is at hand.

A Quarter of a Million People are Making Money with

The OLIVER Typewriter

The Standard Visible Writer

The Oliver Typewriter is a money-maker, *right from the word "go!"* So easy to run that beginners soon get in the "expert" class. *Earn* as you *learn* Let the machine pay the *17 cents a day*—and all *above* that is *yours*.

Wherever you are, there's work to be done and money to be made by using the Oliver. The business world is calling for Oliver operators There are not enough to supply the demand. Their salaries are considerably *above* those of many classes of workers.

"An Oliver Typewriter in Every Home!"

That is our battle cry today. We have made the Oliver *supreme in usefulness* and absolutely *indispensable* in *business*. Now comes the conquest of the home.

The simplicity and strength of the Oliver fit it for family use. It is becoming an important factor in the home training of young people. An *educator* as well as a *money* maker.

Our new selling plan puts the Oliver on the threshold of every home in America. Will you close the door of your home or office on this remarkable Oliver opportunity?

Write for further details of our easy offer and a free copy of the new Oliver catalog. Address

The Oliver Typewriter Co.
Walnut and Tenth Streets, Philadelphia

The most complete directory of the automobile industry is the

MOTOR CYCLE, MOTOR BOAT & AUTOMOBILE TRADE DIRECTORY

(Published in Philadelphia—Quarterly)

January, April, July and October

IT CONTAINS

A complete and accurate classified list of all the manufacturers of Motor Cars, Motor Cycles, and Motor Boats and their parts and accessories.

A complete alphabetical register of brands of Motor Cars, Motor Cycles and Motor Boats and their parts and accessories.

A complete classified list of makers of machinery and tools for automobile manufacturing and repairing and shop equipment generally.

List of trade associations and club organizations with names of officers and other particulars.

Engineering data and tables for the use of the manufacturer and repairman.

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Single copies,	$0.50
Quarterly, one year,	1.00
" five years,	4.00

Sample copies sent free to anyone connected with the industry on request written on business stationery.

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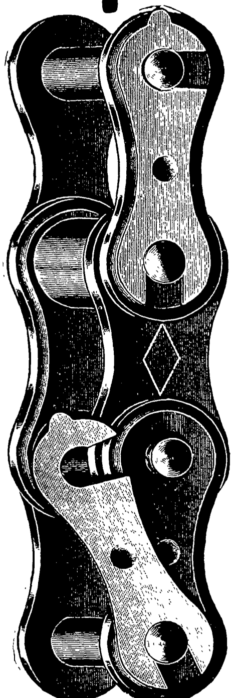


DIAMOND CHAINS

Drove the Simplex to Victory in the National Stock Chassis Race at Lowell

When a successful driver like George Robertson picks out a car to drive in a big race, you can be sure that the individual parts of that car are pretty good. This is especially true of the driving mechanism, on which all depends. It is therefore a significant fact that both the Locomobile in the 1908 Vanderbilt Cup and the Simplex in the National Stock Chassis Race, with which Robertson won his laurels were driven by Diamond Chains.

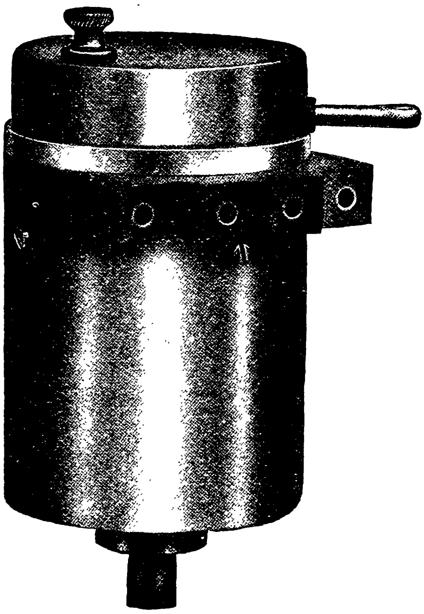
Time and again, such Diamond double chain drives as were used on these cars have demonstrated their speed and reliability in big races, and in many other ways have proven their superiority over shaft drives.

A double chain drive is much lighter for a given duty and the power is applied at the strongest part of the axle, instead of at the weakest, as with a shaft drive. A chain drive costs less at the start, and much less for upkeep. When a shaft drive goes wrong there is considerable expense, for the repair can be made only by experts. A chain drive being more flexible is less subject to damage, but with a chain drive even if a chain does break, a new link may be put in and the car is ready for the road in a few minutes. If the chains you are now using are not satisfactory, try Diamond and you will be pleased with the result.

Capacity 8,000,000 *feet per year*

Diamond Chain & Mfg. Company

260 W. Georgia Street :: :: INDIANAPOLIS, IND.



Nothing on the Dash but the Switch

Demand on Your New Car A Perfect Ignition System

One that is thoroughly efficient at **all** motor speeds and under all conditions. Simple in operation and wiring. Compact and neat in appearance. Most economical in current consumption. Nothing but

THE B. & S. IGNITER

will meet these requirements.

The Briggs & Stratton Company, Milwaukee

SUPPLEMENTARY SPIRAL SPRINGS

The Pioneer Shock Absorbers. Made on the right principles in the first place, they have stood the test of time and are today universally conceded to be the greatest device in the world for saving your car.

THE SPRING OF FAME
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TRADE MARK REGISTERED U.S. PATENT OFFICE
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You can't buy better shock absorbers than SUPPLEMENTARY SPIRAL SPRINGS because there aren't any better.

Send for copies of letters from users, giving their actual experiences with **SUPPLEMENTARY SPRINGS.**

St. Louis Supplementary Spiral Spring Co., 4522 Delmar Avenue
ST. LOUIS, MO.

New York Office: 1876 Broadway, Room 202

BRANCHES:—BOSTON, 893 Boylston St.; CHICAGO, 233-237 E. Randolph St.; PACIFIC COAST, 424 Stanyan St., San Francisco; TORONTO, ONTARIO, CANADA, T. Eaton Company.

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A New Emergency Size

Twenty Hours of Light Carried in Your Tool Box

If you should forget to investigate your supply of light until too late—

This little tank in your tool box gives you 20 hours of light, for emergencies.

It is our regular Motorcycle tank, 12 inches long and 4 inches in diameter. Weighs only 7 lbs. Simply carry some extra rubber tubing and connect it in a moment.

Prest-O-Lite (Motorcycle Size), $10

Full Tank, in Exchange for empty, 60c.

Capacity for Motorcycles, 40 hours, with ¼ ft. burner.

The Prest-O-Lite Co., 237 East South Street
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Branches at New York, Boston, Philadelphia, Cleveland, San Francisco and Toronto.

4000 Exchange Agents

DEALERS: Write us about this at once.

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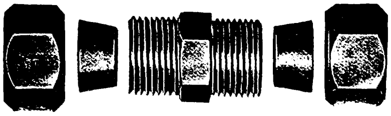

Pat. Dec. 8, 1908

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Send us your specifications and we will be pleased to quote you interesting prices on your BRASS WORK.

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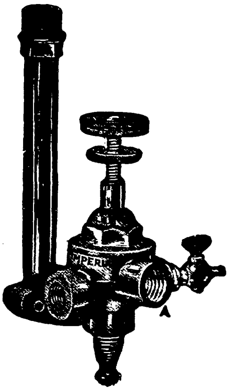

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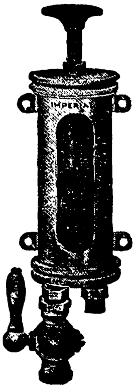

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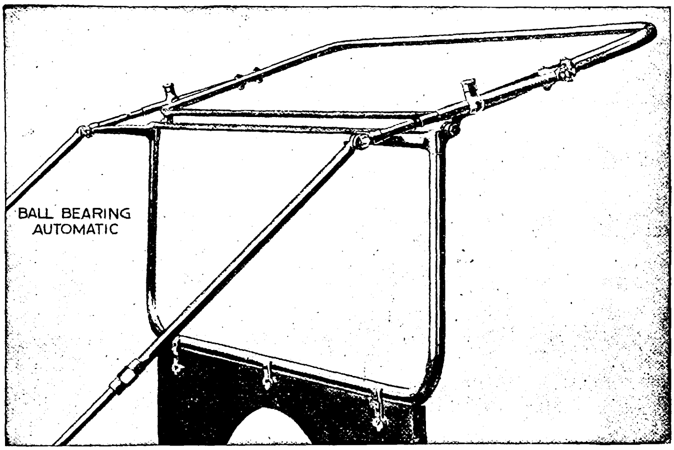
1910

The Avalon Adjustable

$25.00



A positive lock when raised. A positive lock when lowered. An all brass shield at the price of a wood shield. No rattle.

Ball-Fintze Co.

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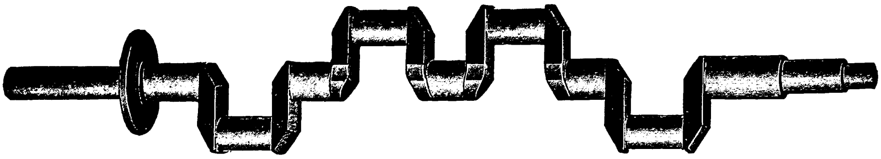

¶ Send us your drawings and specifications and let us show you what really good work is. It won't cost you any more than you are paying for unsatisfactory service, and you will be sure that all cylindrical parts are ground true to sizes and that wrist-pins and bearings are in perfect alignment. You get the benefit of our years of experience. We will be pleased to quote you on any size or quantity.

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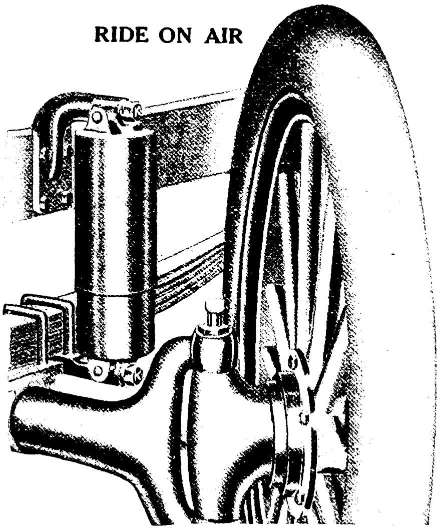


PATENTED U. S. AND ALL FOREIGN COUNTRIES

Insist that your car is equipped with the best, as the best in the end is true economy.

The only device that will effectually absorb the excessive motion and vibration, both DOWN and UP, allow the free normal spring play and yet require no attention is

The Kilgore Improved Automobile Air Shock Absorber

Made for those seeking comfort and quality, not price. Kilgores insure a uniform speed over all kinds of road with perfect comfort and safety to the occupants.

Eliminates spring breakage and doubles tire wear.

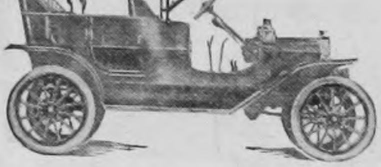
Made on the only correct principle—ask any mechanic. Our 30 days' trial will convince you of the superiority and desirability of the Kilgore. One year guarantee.

$75, $85, $95, PER SET OF FOUR

Write for particulars, testimonials, etc.

KILGORE MFG. CO., 585 BOYLSTON ST., COPLEY SQ.
BOSTON, MASS.

CHAS. R. EVANS, President Tel. B. B. 1383 **F. O. KILGORE, Vice-President**



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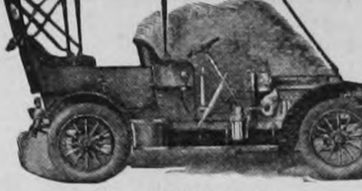

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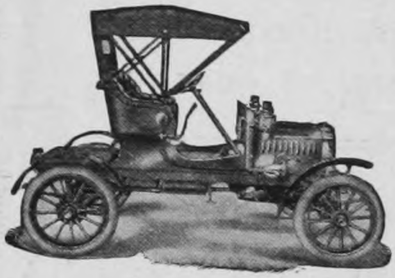
TOPS

W. H. Newton & Son, 123 Elm St., Cortland, N.Y.



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MEASUREMENTS ON HAND FOR FORDS, MAXWELLS, BUICKS, OVERLANDS, CADILLAC 30, CHALMERS-DETROIT; E. M. F., BRUSH, HUDSON, Etc.

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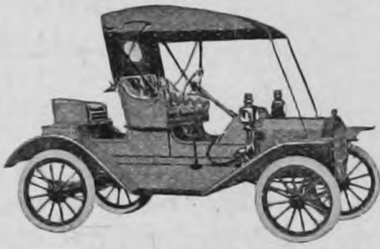

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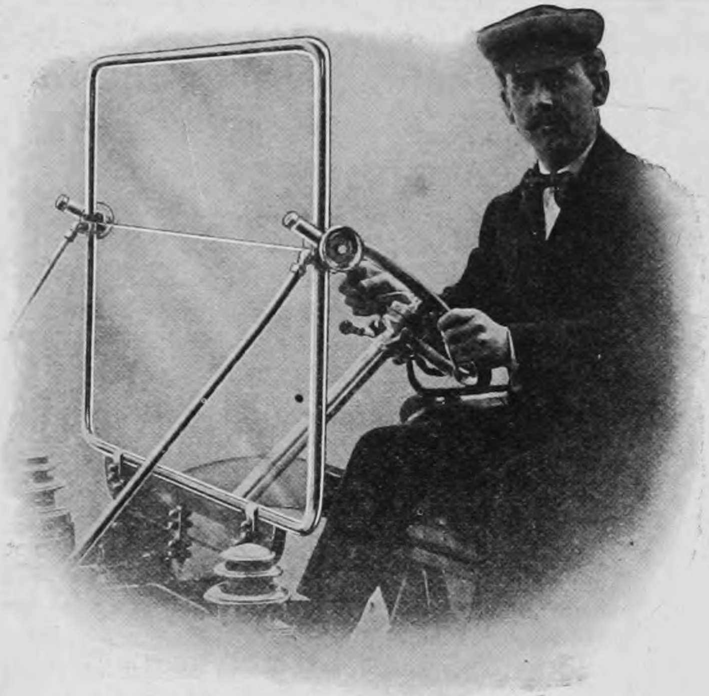

Cox "Clear Vision" Automatic Wind Shield

The Only Automatic

"Clear Vision”

Wind Shield made

Has important features not foun on any other Shield on the ma ket. Absolutely the best shiel made.

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Price, $35.00

Catalogue Upon Request
Established 1872
ALBANY, N. Y.
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Some of Our Specialties

- Wind Shields
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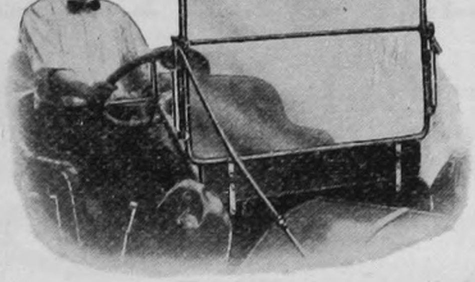


GORDON

Duplex

Automatic Shield

Folding either way, one-half of the Shield over. It gives the people in the car more ir than if only one-third of it was folded over, and it brings the brass cross channel below the range of vision and the driver is not continually rising in his seat or lower-ng his head to get a clear view of the road.

Should the Shield strike the steering wheel, it can be folded outward.

The action of the Shield is controlled by n oiled tempered spring concealed in the ide cylinder, and this spring is guaranteed not to break and will be replaced without ny charge at any time. On the end of the plunger is a double action leather valve which works with air.

The frame is made of heavy brass tub-ng. The hinges are heavy strong manganese brass castings. The brace rods are adustable and the plate glass is set in rubber channel. A pair of heavy clips to hold the rame to the Shield and heavy clips to hold he Shield to the filler board are furnished. Rubber bumpers are fitted in the clips which hold the frame to the filler board and the Shield cannot rattle when folded over.

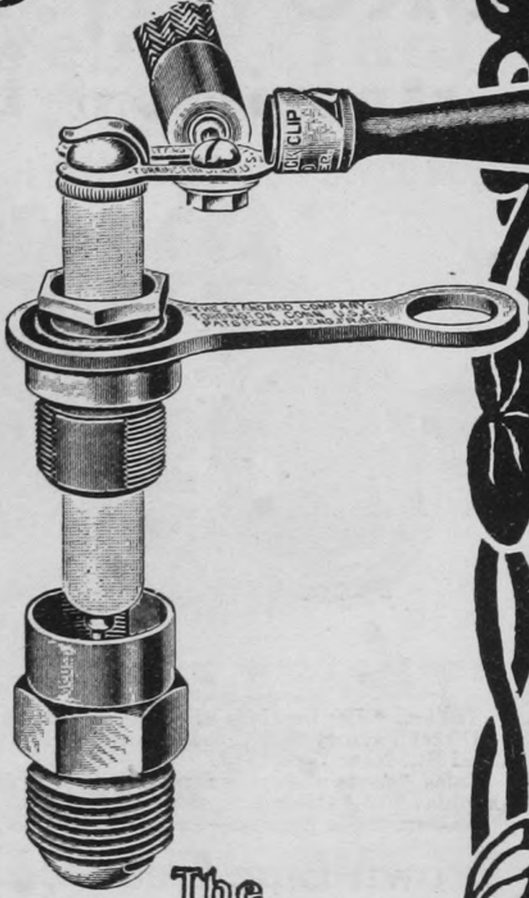
With every Shield we furnish a mahogany filler board 36″ long, 6″ high, and if specified we can furnish a board 9″ high or 12″ high with 44″ Shield, 40″ board is urnished.

The Shield is made in 3 sizes, all being 28″ high, and for runabouts are 37″ wide, for medium touring cars 41″ wide, and for arge touring cars 44″ wide.

We do not cut filler boards, as there are several hundred makes of automobiles, each with a different dash, and it is utterly impossible to fit different dashes without accurate patterns. Any carpenter can cut the board to fit the dash in a few minutes, or you can do it yourself. The boards are grooved on the top edge to fit the round brass frame of the Shield.

No.	**Shield, 37 inches wide.........**	**$25.00**
No.	**Shield, 41 inches wide.........**	**25.00**
No.	**Shield, 44 inches wide.........**	**27.50**

Nickel plated or gun metal finish, $5.00 extra.



CLIP
TORRINGTON CONN. U.S.
THE STANDARD COMPANY TORRINGTON CONN. U.S.A.

The "Breech-Block" Plug

$1 EA.

The Standard Company
Torrington
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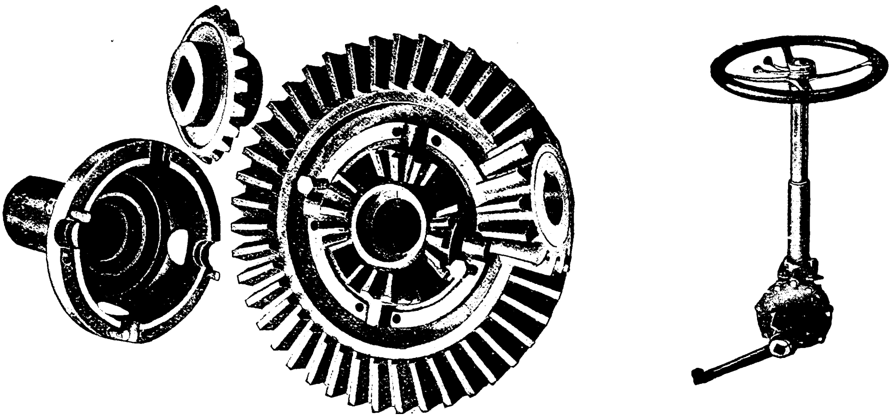
BROWN-LIPE GEARS

Transmission—Differential—Steering



Timken roller bearings are used as our regular equipment for transmissions.
Direct Factory Salesmen:—K. Franklin Peterson, 166 Lake St., Chicago, Thomas J. Wetzel, 29 W. 42nd St., New York City.
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Brown-Lipe Gear Co., 206 S. Geddes St., Syracuse, N. Y.

Chase

Automobile Robes

For All Seasons

¶ Fine Mohair Plush Robes in Plain Colors and Beautiful Fur Effects.

¶ Rubber Face and Rubber Interlined Robes for Fall and Winter Use. Cloth Robes of all Descriptions. The name "Chase" on your Robe is a Guarantee of Quality.

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L. C. Chase & Co., Boston, New York, Chicago, San Francisco

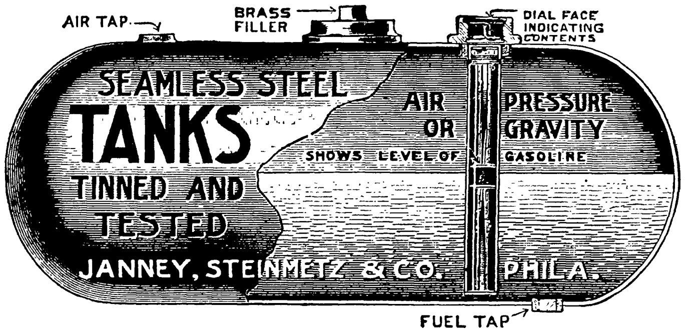
VANDERBILT CUP RACE

Seamless Light-weight Tanks

READY 18 INCHES DIAMETER, 30 TO 40 GALLONS

WE MAKE TANKS, BIG AND LITTLE, FOR AUTOMOBILES AND POWER BOATS

PRESSURE


AIR TAP
BRASS FILLER
DIAL FACE INDICATING CONTENTS
SEAMLESS STEEL
TANKS
TINNED AND TESTED
AIR OR PRESSURE GRAVITY
SHOWS LEVEL OF GASOLINE
JANNEY, STEINMETZ & CO. PHILA.
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GRAVITY

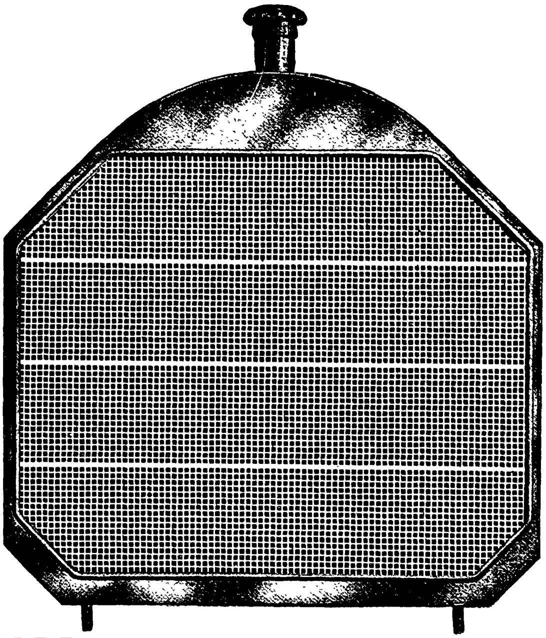
SURE, SAFE, TESTED, RIVETLESS, LEAKLESS

TANKS all sizes, from 1 pint to 100 gallons, SEAMLESS

NEW 1909 TANK CATALOG READY

JANNEY, STEINMETZ & CO. :: PHILADELPHIA AND NEW YORK

FEDDERS Real Square Tube RADIATOR



We furnish either our regular staggered tube radiator or the straight lines as shown on cut. **But, remember,** ours is the **real square tube radiator**; no square tube effect or imitation.

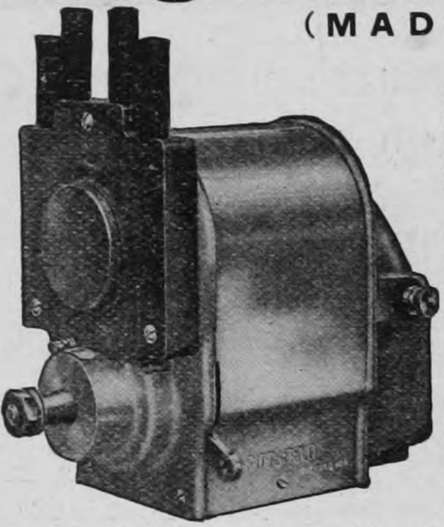
We are the only concern making a real square tube radiator.

Of course, the square tube is better—that's why the others imitate it.

Fedders Mfg. Works
57-65 Tonawanda Street
Buffalo :: New York

High Tension Magnetos

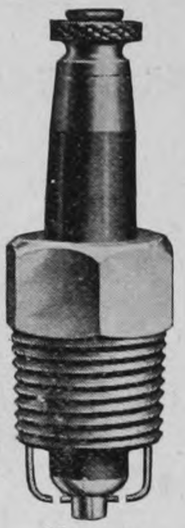
(MADE IN AMERICA)



The man who uses a PITTSFIELD SYSTEM never gets in a tight place and sticks there for want of sufficient power from his motor. Any good motor can furnish the power if the mixture is properly ignited.

The PITTSFIELD MAGNETO gives the maximum efficiency of the fuel, the full power of the motor and increases the snap of the engine a hundred per cent.

One-quarter turn of the crank with the timing lever fully retarded starts the motor equipped with a PITTSFIELD MAGNETO. Perfect timing is assured through the absence of small and delicate parts in the Distributor. Absence of coil troubles is obtained, since there are no moving wires. Primary and Secondary currents generated in stationary coils.



Magneto
Spark Plug

All Pittsfield Systems are Trouble Proof. Write for Details.

PITTSFIELD SPARK COIL CO.

DALTON, MASS.

SALES REPRESENTATIVES: New England States, W. J. Connell, 36 Columbus Ave., Boston. **Atlantic States,** Thomas J. Wetzel, 17 West 42d St., New York. **Central States,** K. Franklin Peterson, H. V. Greenwood, 166 Lake St., Chicago; L. D. Bolton, 319 Hammond Building, Detroit. **Pacific Coast,** The Laugenour Co., San Francisco, Cal.

A full line of "Pittsfield" goods on sale by H. V. Greenwood, 166 Lake Street, Chicago

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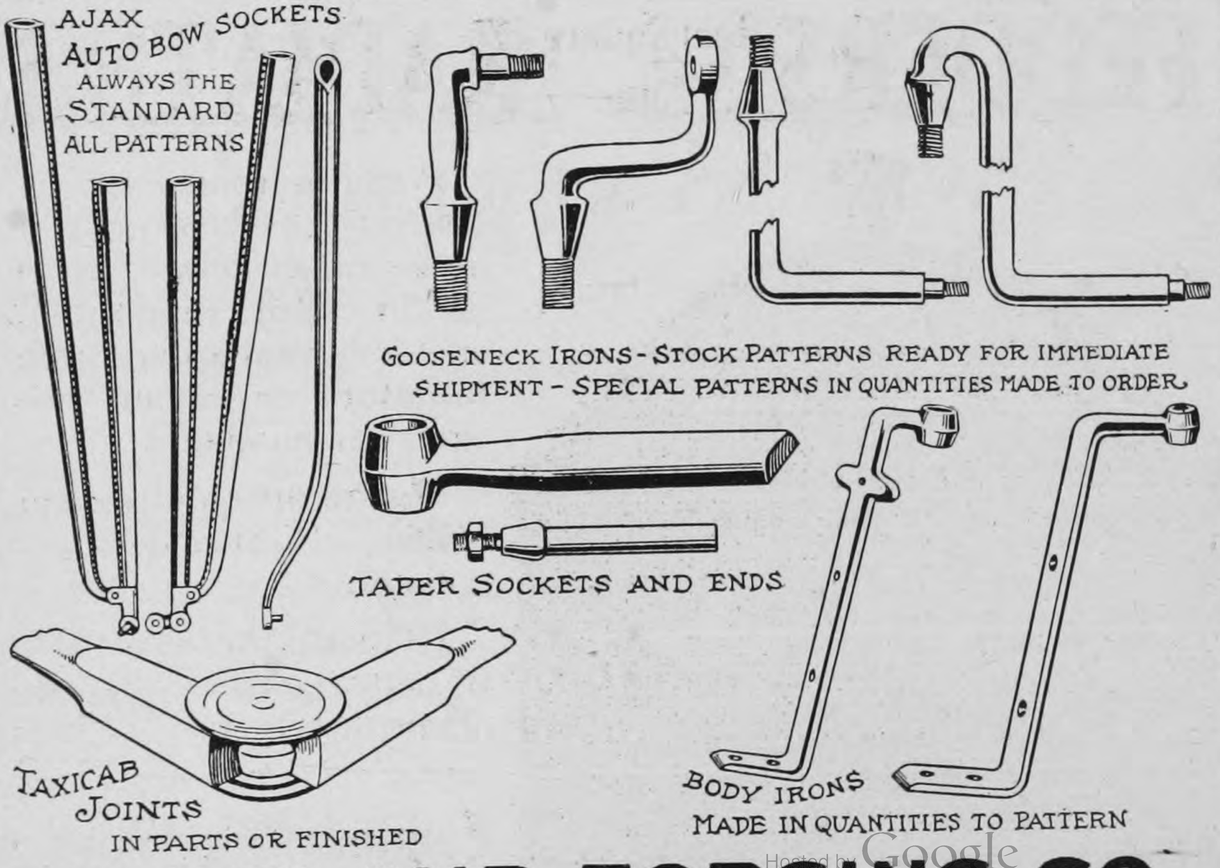
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AUTO BOW SOCKETS
ALWAYS THE
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TAPER SOCKETS AND ENDS
BODY IRONS
MADE IN QUANTITIES TO PATTERN
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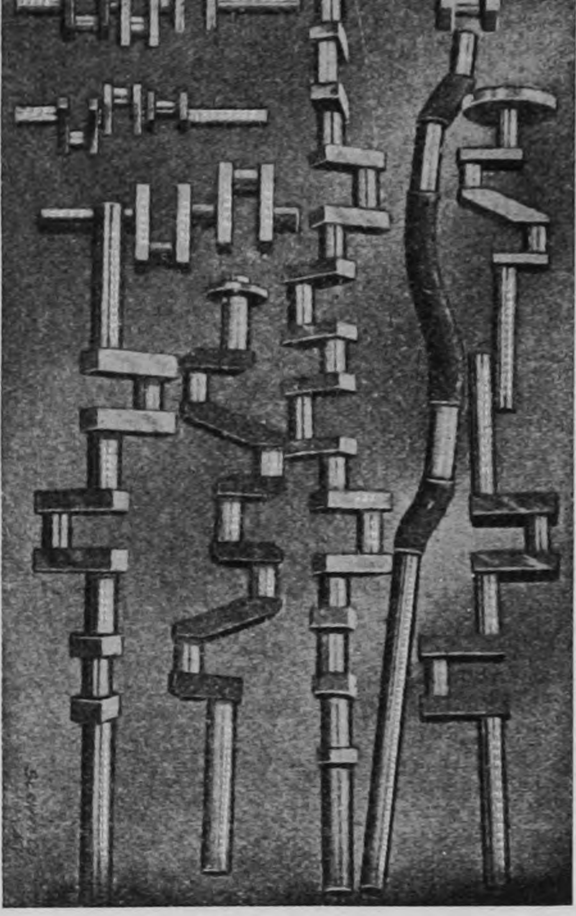
IN PARTS OR FINISHED

CORTLAND FORGING CO.



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The P. H. Gill & Sons Forge an Machine Works, Lorraine and Otseg Streets, Brooklyn, N. Y. We wish t call the Trade's attention to our Chrom Nickel Steel Crank-Shafts and Gea Blanks, etc., Domestic and Foreign.

NO DROP FORGINGS

We have special adapted Crank Pi Machines for making Crank-Shafts true- round within one-quarter-thousandth o an inch. We also make axles complete finished or forged only; also all kind of automobile and marine forgings.

Crank-shafts up to 6″ dia. All anvil- forged, hammered out of Acid O. H. Stee or Nickel Steel or Chrome Nickel Steel.

VALUABLE PREMIUMS

With NEVERLEAK

The following is a partial list of the elegant and useful premiums which you can obtain in return for Neverleak Certificates. One Certificate is enclosed with each dozen four ounce tubes. Write us for the complete list of premiums.

FOR FIFTEEN CERTIFICATES we will send you a genuine $6.00 self-filling Conklin Fountain Pen; a large, massive, solid 14K gold pen and a beauty, which retails at $6.00.

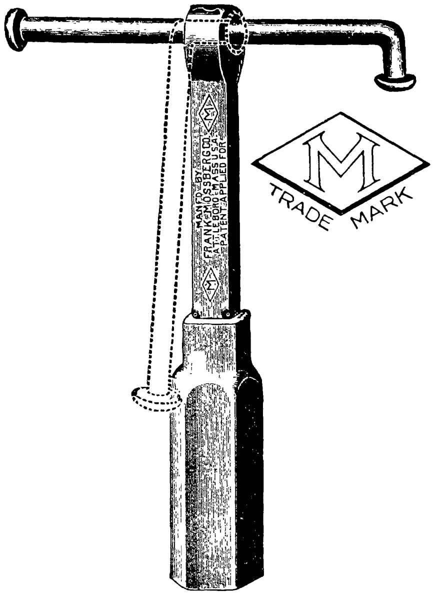
FOR TWENTY CERTIFICATES we will send you a 42-piece decorated china Dinner Set. The china is of fine quality and pure white. The decorations consist of graceful sprays of blue forget-me-nots and exquisite tracery from pure coin gold. The decorations are all hand work.

FOR THIRTY-THREE CERTIFICATES we will send you one fine solid Cowhide Leather Suit Case, 24 inches long. It has a steel frame, cloth lining, No. 17 Vienna handle and solid leather corners. A fine, substantial, high-grade Suit Case.

FOR FORTY--EIGHT CERTIFICATES we will send you a 20-year, gold-filled watch, with open face, No 16 size, latest thin model, pendant setting and screw back. The movement is fully guaranteed New York Standard, 7 jewel and is one that will give the very best of satisfaction.

Send Certificates direct to

The Mossberg Socket Wrench


MANF'D BY FRANK MOSSBERG CO. ATTLEBORO MASS U.S.A. PATENT APPLIED FOR
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TRADE MARK

1-3 SIZE
Patent applied for

is such a convenient and adaptable tool that it is a necessity in every tool equipment.

SOCKET WRENCH
SET NO. 6

in wooden or leather case, has 8 pressed steel sockets fitting all sizes in general use.

ASK ABOUT IT

FRANK MOSSBERG CO.
ATTLEBORO, MASS

45-47 Lake Street
Chicago

132 Valencia Street
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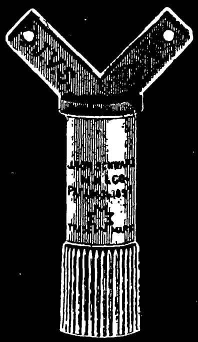
THERE IS BUT ONE GOOD BURNER

VON SCHWARZ



"PERFECTION"

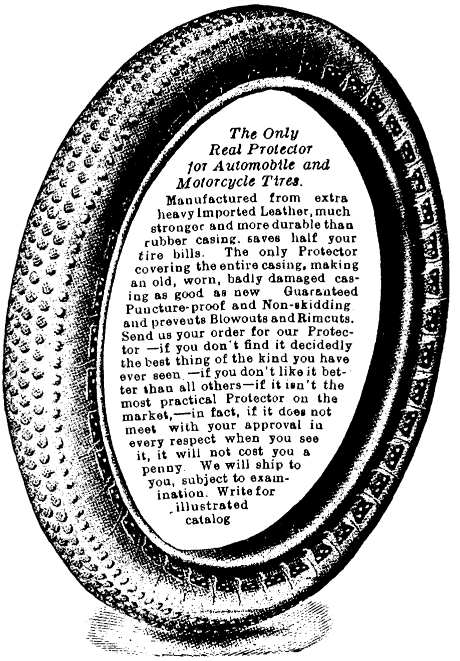
AND VON SCHWARZ IS ITS MAKER

FOR SALE EVERYWHERE!

When a man tries to substitute another burner, it is not because he discovered something better, but something cheaper, or more profitable. Note marks on pillars and tips.

M. KIRCHBERGER & CO., 339 Broadway, New York City

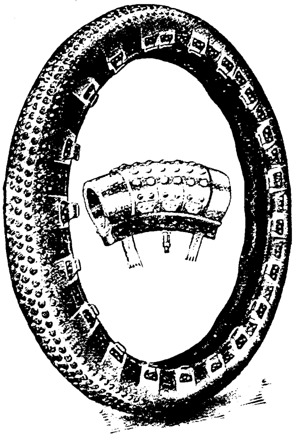
The 20th Century Tire Protector for Automobiles and Motorcycles



The Only Real Protector for Automobile and Motorcycle Tires.

Manufactured from extra heavy Imported Leather, much stronger and more durable than rubber casing, saves half your tire bills. The only Protector covering the entire casing, making an old, worn, badly damaged casing as good as new Guaranteed Puncture-proof and Non-skidding and prevents Blowouts and Rimcuts. Send us your order for our Protector —if you don't find it decidedly the best thing of the kind you have ever seen —if you don't like it better than all others—if it isn't the most practical Protector on the market,—in fact, if it does not meet with your approval in every respect when you see it, it will not cost you a penny We will ship to you, subject to examination. Write for illustrated catalog

The 20th Century Emergency Patch Has Reached the Acme of Perfection

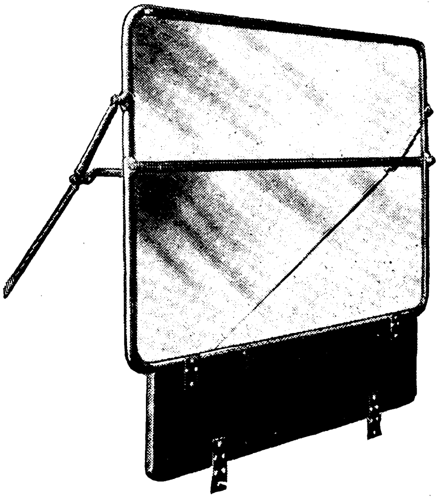


Let us send you sample of our Standard size, 8″ Emergency Patch, any size tire, post-paid, $2; and if you don't find it decidedly the best thing of the kind you have ever seen—if you don't like it better than all others,—if it isn't the most practical Patch on the market,—in fact, if it does not meet with your approval in every respect when you see it, it will not cost you a penny. Simply return it to us and we will refund your money. Special lengths, 10 to 24 inches. Prices range from $2 to $4. Write for Dealers' and Jobbers' prices.

20th CENTURY TIRE PROTECTOR COMPANY, Midlothian, Texas

The Smoothest Wind Shield Proposition

EVER BUILT



Up or down with one hand without changing position in your seat or slackening speed.

A positive lock, up or down.

No rattle or noise.
No thumb screws to get loose.
No coil springs to break glass.
No rubber bumpers to wear out.

The best constructed shield on the market. Solid brass frame and manganese bronze castings. Write us to-day for descriptive circular.

Douglas & Lomason Co.
Dept. C, DETROIT, MICH.

The quality sells the Shield.

Our Price makes you money.

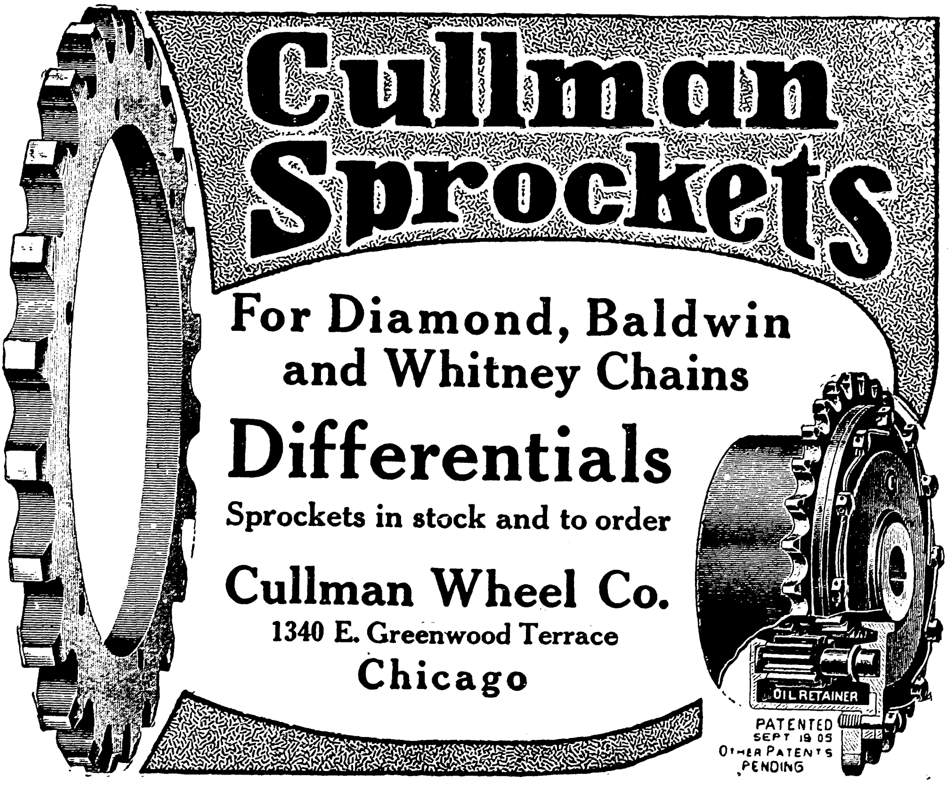
Quick Delivery

Pressed Steel Automobile Frames

Extensive press equipment recently installed enables us to take on more pressed steel frame business for quick delivery. Send us blue prints for quotations.

A. O. SMITH COMPANY

257 Clinton Street Milwaukee



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For Diamond, Baldwin and Whitney Chains

Differentials

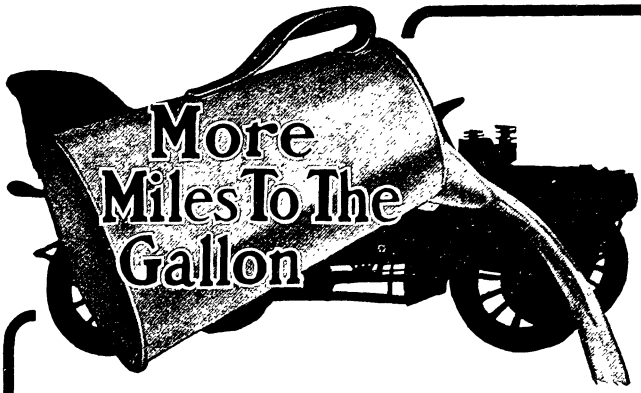
Sprockets in stock and to order

Cullman Wheel Co.

1340 E. Greenwood Terrace

Chicago

OIL RETAINER
PATENTED SEPT 19 05
OTHER PATENTS PENDING


More Miles To The Gallon

UNLESS your car has perfect lubrication, your gasoline is used for friction instead of miles of speed. The use of Vacuum MOBILOIL saves the wear of your car, the waste of gasoline, and most of the money that goes for repairs.

Vacuum MOBILOIL is made in six different grades to suit the lubrication of every automobile made. One of these grades is exactly adapted to the needs of *your* car.

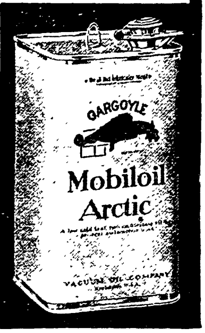
Its use is an investment that saves expense. It will end forever your lubrication troubles, and add to your pleasure and the life of your car.

Write for free booklet showing grade of MOBILOIL adapted to the use of every car. Gives track records to date, and money-saving motor hints.

VACUUM

MOBILOIL

in barrels, and in cans with patent pouring spout, is sold by dealers everywhere.
Manufactured by
VACUUM OIL CO., Rochester, N. Y.



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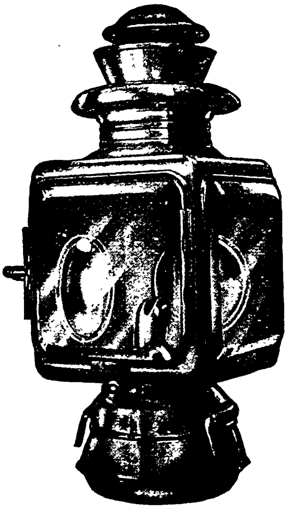
HAM'S LAMPS

are always Reliable



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The Handsomest and Best Burning Small Square Lamp on the Market. A Very Attractive Design.

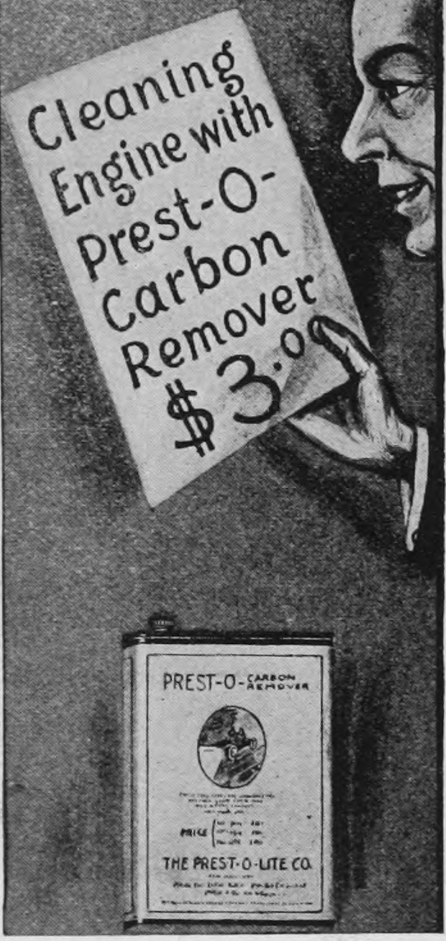
They are built on the Ham Perfect "cold blast" principle, which insures a clear, steady, white light, that will not blow out in the strongest winds, or jar out on rough roads.

They are beautiful in design and finish. An ornament to any car, to give it the artistic finish.

We have a very attractive proposition to offer Manufacturers of, and Dealers in Runabouts and High Wheel Automobiles.

Write for particulars. Address "Dept. D."

C. T. Ham Mfg. Company
ROCHESTER :: N. Y.


Cleaning Engine with Prest-O-Carbon Remover $3.00
PREST-O-CARBON REMOVER
THE PREST-O-LITE CO.

Make a Hit With Your Customer

Garages everywhere are putting out signs, offering to clean all the carbon out of an engine for $3 to $5.

There's good money in it, because it takes so little labor and time, with

PREST-O-CARBON REMOVER

Your customer could use it at home, but he'd rather hire the job done, if the price is right. Make it easy for him, and he will have his engine cleaned often.

The day of tearing down and scraping engines is closing. The new and better way has arrived. Get in and get your share!

Order some of this liquid, and write us for full information. Retail prices: Gal., $3.75; Half Gal., $2; Quart, $1. In cans. Guaranteed.

The Prest-O-Lite Co., 237 East South Street
INDIANAPOLIS, IND.

Branches at New York, Boston, Philadelphia, Cleveland, Minneapolis, Omaha, Dallas, Los Angeles and San Francisco.

BLUE RIBBON

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CREAM
METAL POLISH
FOR CLEANING & POLISHING ALL METALS

THE 20TH CENTURY AUTO POLISH

Outshines and Outlasts Them All

The Only Practical and Economical Polish Made for Garage Use, in 5 and 10 Gallon Cans—Does Not Settle

A THICK OIL CREAM POLISH

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industry
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AUTOMOBILE
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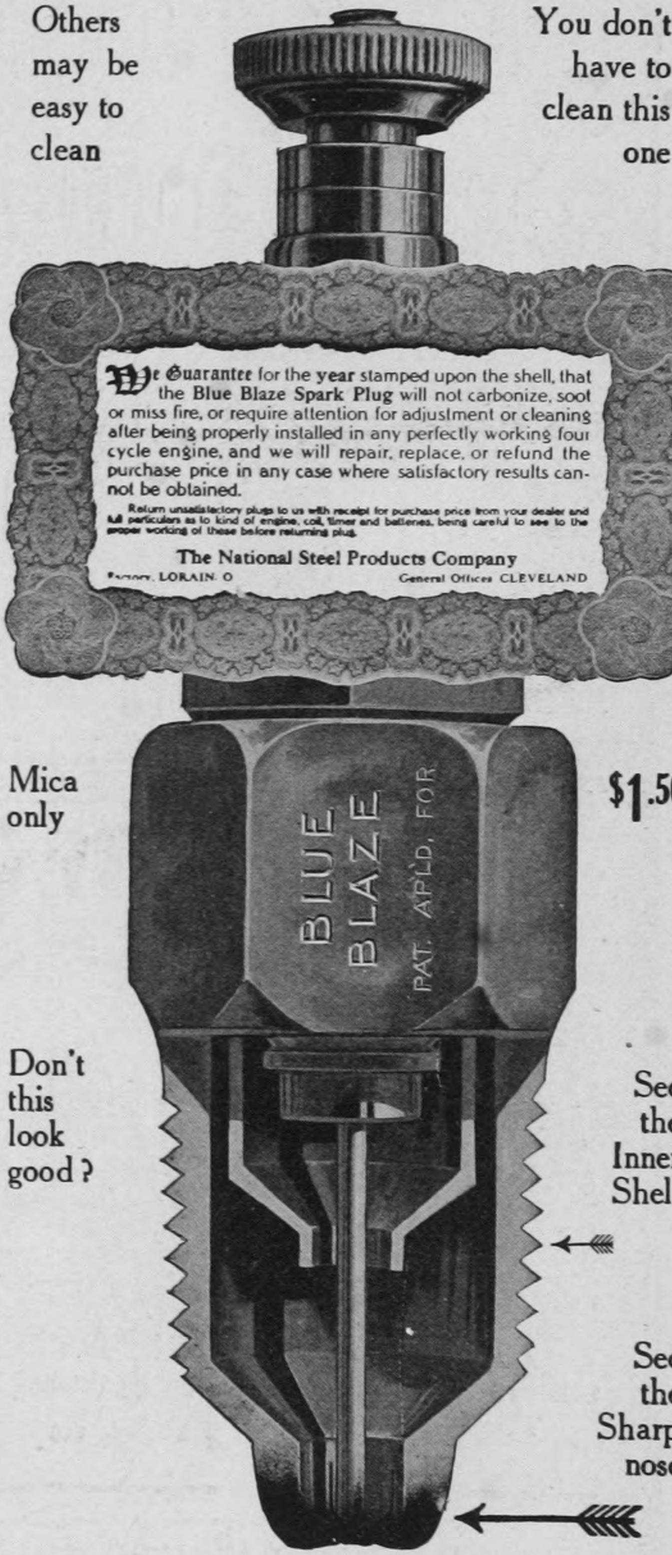

We Guarantee for the **year** stamped upon the shell, that the **Blue Blaze Spark Plug** will not carbonize, soot or miss fire, or require attention for adjustment or cleaning after being properly installed in any perfectly working four cycle engine, and we will repair, replace, or refund the purchase price in any case where satisfactory results cannot be obtained.

Return unsatisfactory plugs to us with receipt for purchase price from your dealer and full particulars as to kind of engine, coil, timer and batteries, being careful to see to the proper working of these before returning plug.

The National Steel Products Company
Factory, LORAIN, O General Offices CLEVELAND

Mica only

$1.5

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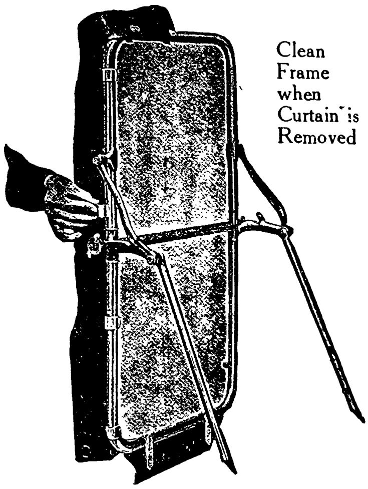
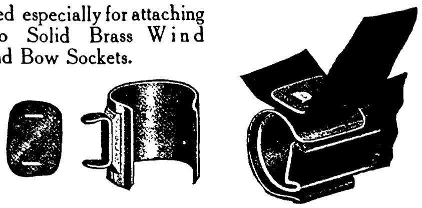
THE SWAN HANDY CURTAIN CLIP



Designed especially for attaching curtains to Solid Brass Wind Shields and Bow Sockets.



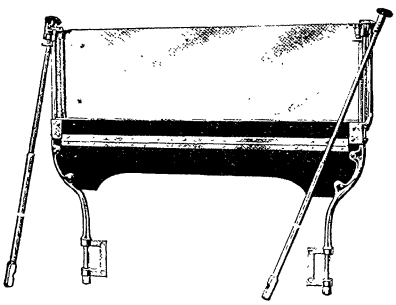
Made of Spring Brass

The curtain which is fitted with these clips may be attached or detached from inside of car.

Since the Solid Brass Wind Shields have been presented to the trade, everyone handling the same has put up a great cry for some simple device for attaching the curtains to the shields—something that could be removed entirely from the shields when the curtains were not in use, so that the metal tubing could be easily polished. Here is the pacifier—THE SWAN HANDY CURTAIN CLIP—so simple that it can be applied in a moment's time by anyone. This device entirely eliminates the necessity of attaching fasteners by soldering or tapping into frame and inserting screws.

In lots of 1 dozen, list price, $1.00. In lots of 100, list price, $7.00. *Write for discount to the trade.*

Manufactured by the **DETROIT AUTO SHIELD COMPANY, 1298-1304 Woodward Ave., Detroit, Mich.**



BANKER WIND SHIELD No 2

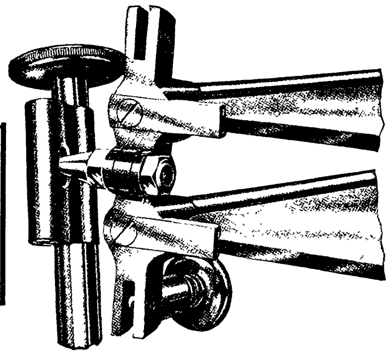
INSIST ON YOUR CAR BEING EQUIPPED WITH A

Banker Wind Shield

There is Quality in Them
OR THEY WOULD NOT BE ADOPTED BY THE MANUFACTURERS OF THE HIGHEST GRADE CARS

THEY ARE USED IN LARGE QUANTITIES BY

AS SUPPLIED TO
- **THE PEERLESS MOTOR CAR CO.**
- **THE PIERCE ARROW MOTOR CAR CO.**
- **THE F. B. STEARNS CO., etc.**



HINGE AND ROD USED ON SHIELD SHOWING GLASS SUPPORT SHELVES

Not How Cheap, But How Good
The Standard of Excellence

BANKER WIND SHIELD CO.

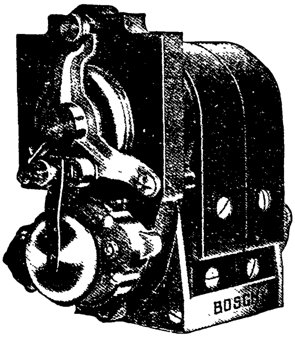
5912 BAUM ST., PITTSBURGH, PA.

TRANSMISSIONS, CLUTCHES, LEVERS

WITH our greatly **increased facilities** for the manufacture of the above articles we are open for some additional business for the season of 1910. Our **factory equipment** is **modern,** thus enabling us to produce **parts** of **first quality.** If you cannot use our regular assembly we can make these parts to your specifications.

WABASH GEAR WORKS

TERRE HAUTE, - - - INDIANA



Vanderbilt Honors *for*

BOSCH MAGNETOS

The Vanderbilt Cup

Won by the BOSCH Equipped ALCO driven by Harry F. Grant, making the remarkable time of 265 min., 42 sec., for the 278.08.

The BOSCH Equipped FIAT driven by E. H. Parker won second place, accomplishing the distance in 270 min., 58 sec.

Wheatley Hills Trophy

Won by the BOSCH Equipped MARMON driven by R. W. Harroun—189 miles in 190 min. No stop during race.

Massapequa Trophy

Won by the BOSCH Equipped CHALMERS-DETROIT driven by Joe Matson. 126.40 miles in 129 min. No Magneto trouble on any BOSCH Equipped car during the race.

Portola Festival Races

In the Racing Meet held at San Francisco during the week of The Portola Festival (Oct. 19-23) ***Every Winning Car, and every Car that finished was equipped*** **with a BOSCH MAGNETO.**

Such sweeping victories, and the satisfactory efficiency of every BOSCH MAGNETO are factors that have made BOSCH MAGNETOS ***The Standard Ignition System of the World.***

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Chicago Branch:
1253 Michigan Ave.

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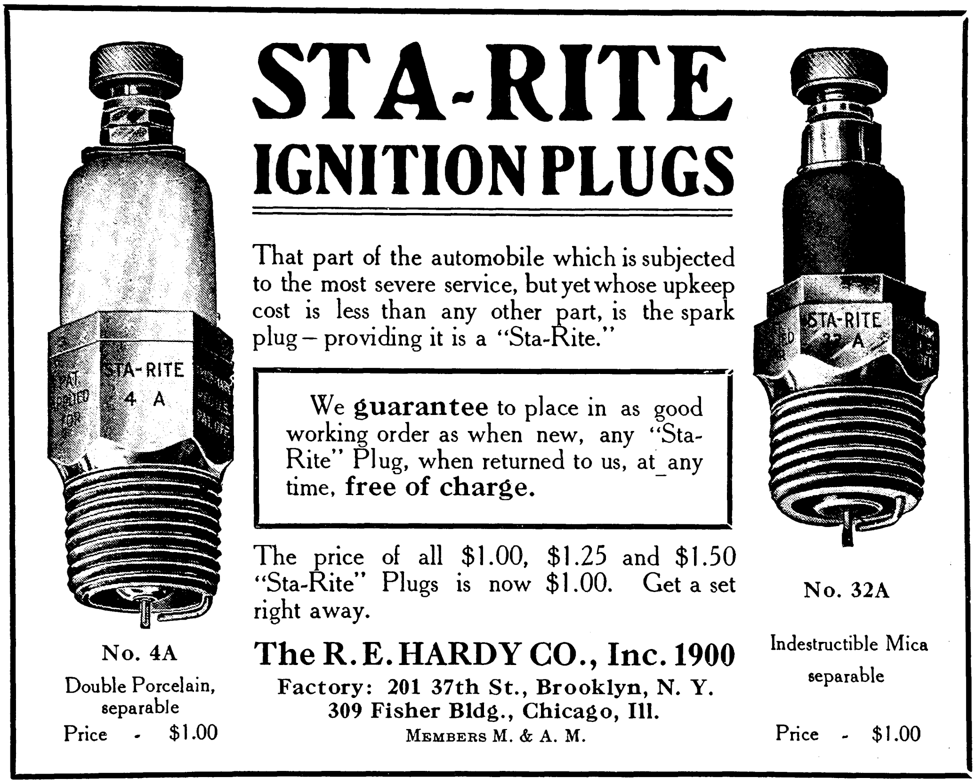
357 Van Ness Ave.



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IGNITION PLUGS

That part of the automobile which is subjected to the most severe service, but yet whose upkeep cost is less than any other part, is the spark plug – providing it is a "Sta-Rite."

We **guarantee** to place in as good working order as when new, any "Sta-Rite" Plug, when returned to us, at any time, **free of charge.**

The price of all $1.00, $1.25 and $1.50 "Sta-Rite" Plugs is now $1.00. Get a set right away.

No. 4A
Double Porcelain, separable
Price - $1.00

No. 32A
Indestructible Mica separable
Price - $1.00

The R. E. HARDY CO., Inc. 1900
Factory: 201 37th St., Brooklyn, N. Y.
309 Fisher Bldg., Chicago, Ill.
MEMBERS M. & A. M.

Watch this space next month!
1910 Tire Sensation will be shown.

Federal Rubber Co.
Milwaukee - Wisconsin

THE NEW SEARCHLIGHT GAS TANK

STRONG AND UNIFORM LIGHT

GUARANTEED 26% MORE HOUR "ACETYLENE LIGHTING" THAN ANY OTHER.

SEARCHLIGHT GAS
MAKES SUNLIGHT AT NIGHT

SIZE OF TANK 22" LONG. 6" DIAMETER
STANDARD CONNECTIONS, WILL FIT ANY CAR

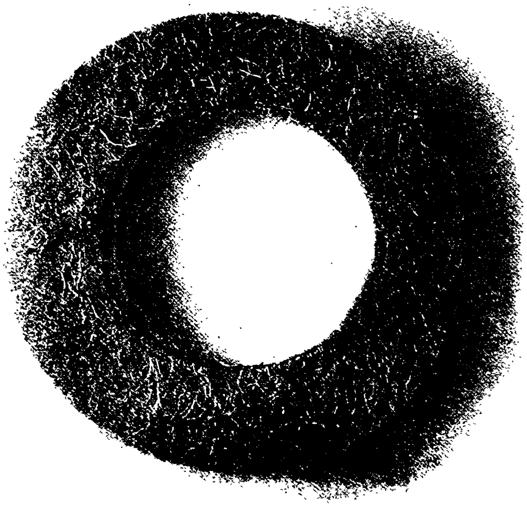
MANUFACTURED UNDER OWN PATENTED SYSTEM

WRITE FOR BOOKLET

THE SEARCHLIGHT GAS COMPANY
PITTSBURGH, PA. WARREN, OHIO.

FELT PACKINGS

FOR
Automobiles
MY SPECIALTY



Dust Rings for the Hubs. Strips for Crank Cases. Washers for all Lubricating and Dust Excluding Purposes.

Please write for Prices and Give Dimensions

Prompt Shipment of all Orders is Assured.

No Order too Small to Receive Careful and Prompt Attention.

N. E. BOOTH, 743-45 39th Street
Brooklyn, N. Y.

HIGH GRADE AXLES
FOR MOTOR CARS

A man thinking and working on *one* thing for *seven* years *must* do that one thing better than a man who works on *seven* things each year.

What is true of an individual is true of an organization.

Concentration—*specialization*—an entire organization "with but a single thought"—high grade axles for pleasure and commercial cars exclusively.

That is why *Timken-Detroit* Axles lead the procession.

Made in Detroit by

THE TIMKEN-DETROIT AXLE CO.

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WE have the Acme Way of making these, and many more parts to specifications of our **Automobile** and **Motor Cycle** trade. Especial facilities for the production of duplicate parts from ¼" to 2¼" dia. and up to 10½" long. Particular attention to orders for Brass up to ¾", for Steel up to ½" dia. Send us your samples for quotations.

- **Cups**
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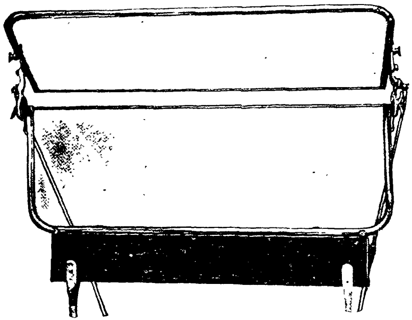
Wind Shield

Yes, it *looks* like the others, but when you examine it closely it is *vastly different.* Works on a *new* principle—*friction discs* instead of springs. *One hand* operates it. You can tilt it *as you like.* The "gap" is an important feature—*protects* you, yet gives you a *clear view ahead.* Price, $35.00—$15.00 *less than inferior shields cost.*

"SEE THAT GAP?"



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Grindine Compound

Obviates *danger* and *expense* of oil and emery. Contains the *hardest* and *sharpest* abrasive obtainable. *The most perfect valve-grinding compound known.* Put up in a carton containing *two tubes*—one coarse, one fine. **Price, 25 cts.** Also packed in larger size tubes containing *five* times the amount, at **75 cts. per pair.** Our **GRINDINE COMPOUND** for Brass will be found of superior quality.

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GRINDINE
COMPOUND

Write for VASCO Catalog TODAY

VICTOR AUTO SUPPLY MFG. CO.
43 West 43d St., New York

The SPEEDOMETER TEST

¶ How many miles are there in a gallon of oil?

That depends on the oil.

¶ How many miles are there in a gallon of gasoline?

That depends on the oil.

¶ How many miles are there in an hour?

Depends on the oil again.

¶ How many miles are there in your car?

It all depends on the oil and the Speedometer answers you truthfully.

¶ If you care about these things, *you* can depend on

MoToRoL

to give you maximum returns from your discrimination in using it.

¶ We ask you to use it after a good speedometer test against all other oils.

¶ Get a test gallon of your dealer. Write us if he is not supplied. Address, Dept. D.

¶ MoToRoL is produced by the Originators and Sole Manufacturers of Non-Fluid Oils.

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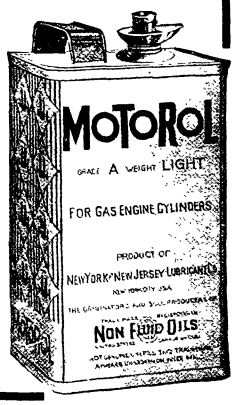
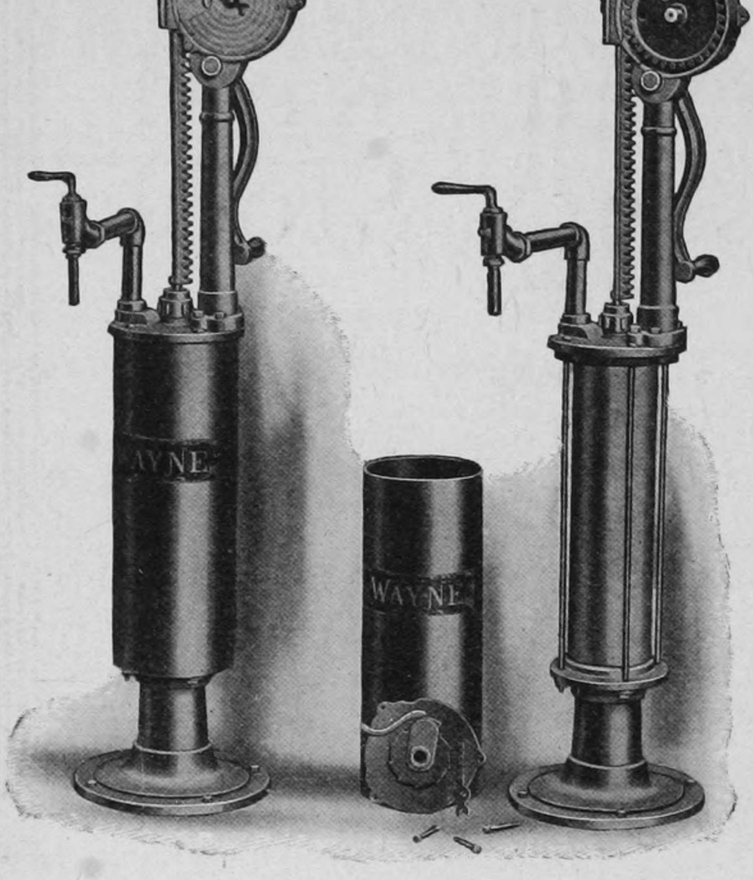

MOTOROL
GRADE A WEIGHT LIGHT
FOR GAS ENGINE CYLINDERS
PRODUCT OF
NEW YORK & NEW JERSEY LUBRICANT CO.
NEW YORK CITY USA
NON FLUID OILS



Cut No. 34, Model E

The Wayne

Long Distance Gasolene Pump

The safest and most accurate in measurement. Quarts, half-gallon and gallon. Always ready; no adjustment necessary.
WAYNE heavy metal galvanized tanks underground last a lifetime. The heavy brass cylinder is protected by metal jacket surrounding it.

We Will Exhibit at the New York Palace Show

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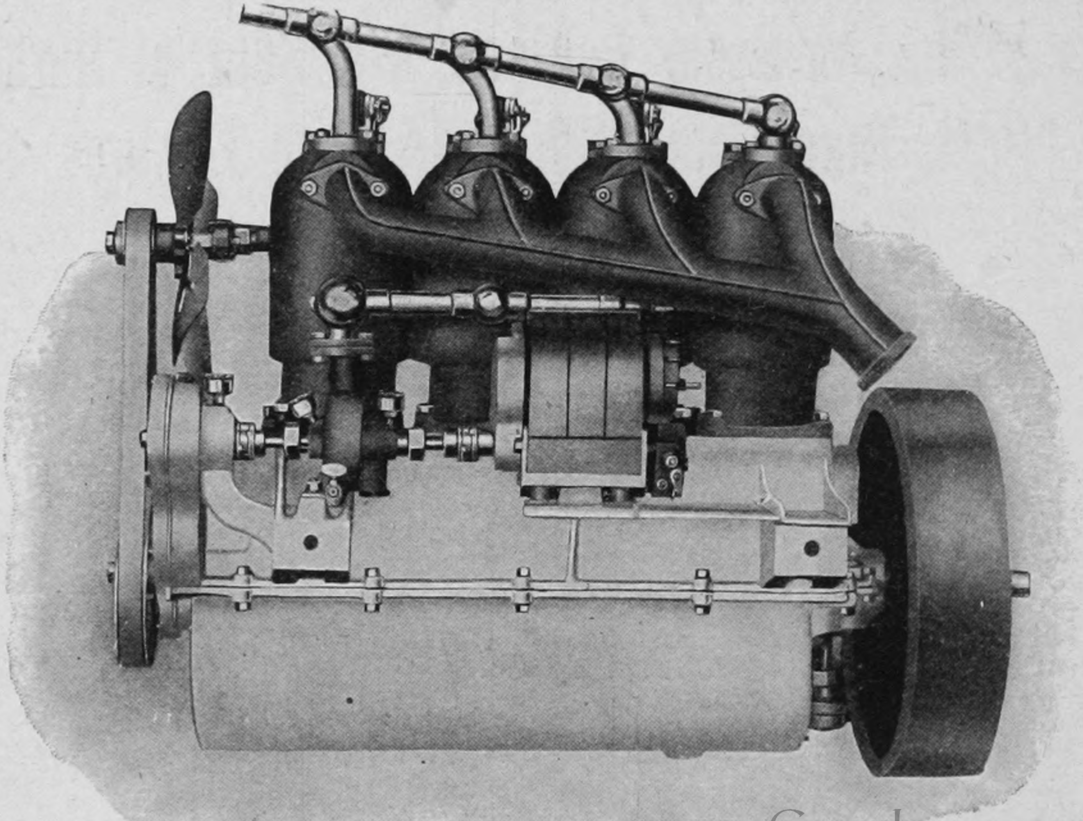
ST. LOUIS: 3921 Olive St.
CLEVELAND: 5454 Lakeside Ave.
WASHINGTON, D. C.: 511 Metropolitan Bank Bldg.
BOSTON, MASS.: 116 Bedford St.



The most powerful motor, with greater bearing surfaces than ever before

A Different Kind *of* Accessory Store

EVERYTHING necessary for the garage. EVERYTHING necessary for the car. EVERYTHING the best

PROMPT SHIPMENTS :: :: LOWEST PRICES

Autolight & Motor Supply Co., Inc.
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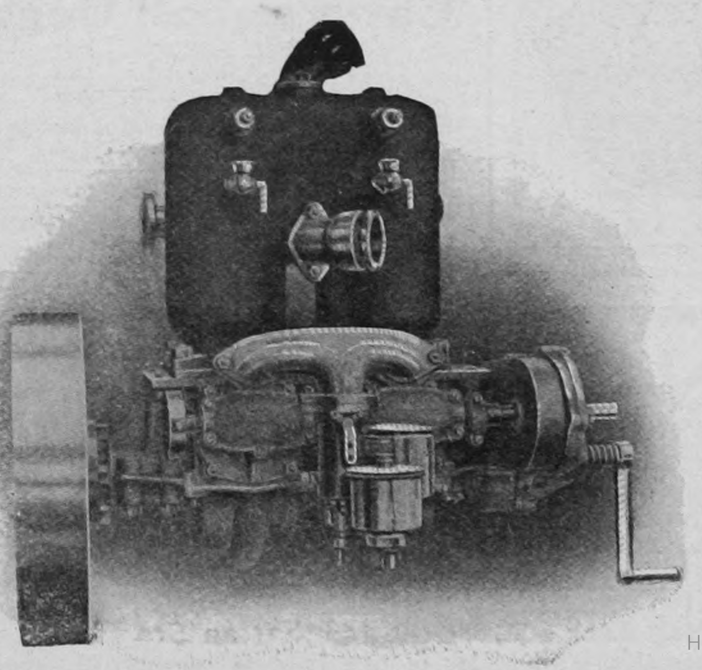
Cars With Two-Cycle Engines Are Sold at Higher Prices Than Cars With Four-Cycle Engines



Why? Because there are so few manufacturers of good two-cycle engines, and because the two-cycle engine has so many features which are superior to the four-cycle type. If you want the best and most efficient motor made, you will want the

WILLET TWO - CYCLE ENGINE

It represents the maximum of efficiency and reliability with the minimum of trouble and cost of up-keep. It is a marvel of simplicity, and the new Rotary valve makes it silent, powerful and flexible. This valve is self-grinding, adjusting and needs no attention.

Made in sizes from
8 to 70 H. P.

BOWSER

SYSTEMS ARE THE BEST KNOWN EQUIPMENT FOR THE HANDLING AND STORING OF GASOLENE

The fact that you handle your gasolene in Bowser Fire-Proof Tanks has considerable influence in bringing new business to you.

The Bowser System protects your business, property, cars of your customers, and the lives of your employes against fire and explosion.

The tank is buried outside and is filled from the outside. The pump is located inside and measures directly into the car the desired quantity of gasolene without exposure to the air.

Send us a postal today for catalog 11

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255 Atlantic Ave.

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TRADE Raybestos MARK

A PERFECT BRAKE LINING AND FRICTION FACING

RAYBESTOS is composed of asbestos woven with copper wire, produces greater friction than metal to metal, and positively will not carbonize.

RAYBESTOS makes Brakes silent in action, enables them to "grip" instantly. This famous fabric is wear-proof—it will outlast the life of any other brake lining many times.

Write us to-day for particulars

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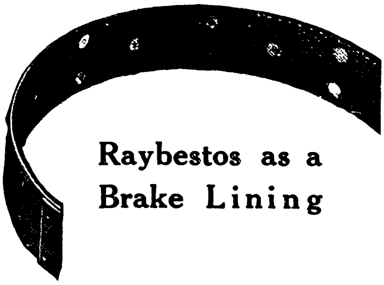
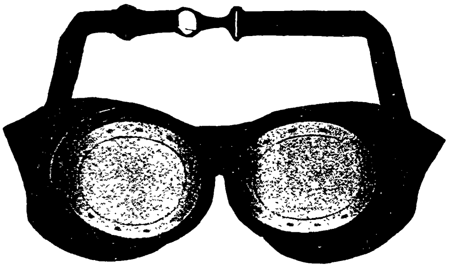


Raybestos as a Brake Lining



RUBBER GOGGLES

IN LARGE VARIETY

Cover Rubber Goggles

Patented July 30th, 1907
June 16th, 1908
March 2d, 1909

Beware of Rubber Goggles not protected by COVER patents

New Catalogue upon application to any jobber.

SUSSFELD, LORSCH & COMPANY
87 and 89 MAIDEN LANE, NEW YORK

WARNING

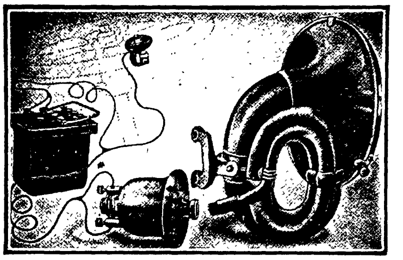
TO THE TRADE

This Company owns all rights to United States Letters Patent No. 899,468, granted September 22, 1908, to William R. Petze, for

Auto Spring Repairers

We are advised by our patent counsel that this patent covers broadly our type of spring repairer, now well known to the trade and to the public, and that all spring repairers of this type made by others are infringements upon our patent. We have recently brought suit in the United States Circuit Court for the Southern District of New York against the Manhattan Storage Co. and 35% Automobile Supply Co., maker and seller of one infringing spring repairer, and intend to proceed vigorously against all others who make or sell infringing articles.

Auto Spring Repairer Co.
123 Liberty Street New York City



CRACK-UNICUM ELECTRIC HORN

Far superior to the old style pneumatic horn.
Write for Bulletin No. 16.

Theo. H. Gary Co., 52 Franklin St., New York

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500 Auto Bodies—"Sale"

All makes—all styles. Touring, Runabouts, Toy Tonneaus, Limousines, Landaulets, at all kinds of prices to clear.

Also 250 Autos cheap. Best makes—Best condition—Lowest Prices.

Write your wants

Broadway Automobile Exchange
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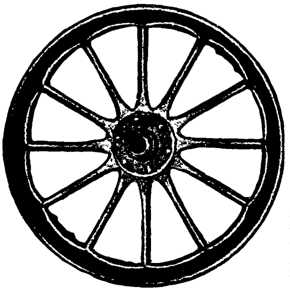

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Manufacturer and Repairer of

Artillery Wood Wheels for Automobiles and the Perfection Wheel Puller

Specially designed spokes give more strength and a natty appearance. Our specialty is making wheels without hubs.

LET US FIGURE ON YOUR REQUIREMENTS

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ALUMINUM SOLDER THAT WILL SOLDER

Directions simple and easy to follow.

Developed for our own use, now put on the market.

Makes soldering aluminum as certain a process as soldering tin cans.

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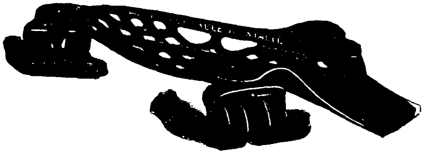
WEBER PORTABLE TURN-TABLE TRUCKS

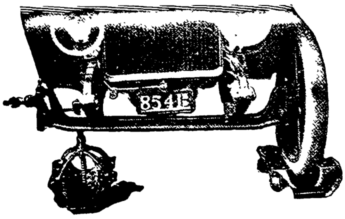
FOR AUTOMOBILES Patented



The U. S. Court has just declared our Patent good and valid in suit against the Pikes Peak Manufacturing Co. We have started suit against "Norwood" for infringing. The only sure way of buying an Auto Turn-Table or Truck is to see that they are branded "The Weber Portable Turn-Table Truck." Factory, Muncie, Ind. For sale by all jobbers. All orders to be sent to headquarters.

THE WEBER CYCLE & SUPPLY CO., Colorado Springs, Colo.

Norwood Portable Turntable or Caster



2 in 1

A caster to go under the wheels.

A jack on wheels to go under the axle.

Pat. Applied For Pat. June 25, '07

Factories and shops can handle cars either with or without wheels. The rock is adjustable and detachable. Write for Circular A. Discount to the trade.

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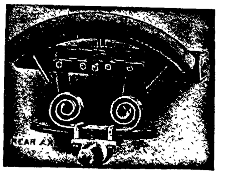

THE BI-CAL-KY Auxiliary Spring & Shock Eliminator is a spring that meets all road conditions automatically. On smooth roads you ride on a light spring and when encountering rough roads you ride on a spring sufficiently strong in keeping with the road conditions. It prevents all rebound. Prevents springs from breaking. Makes car ride more comfortable. Makes car handle easier on rough roads. Lengthens life of tires and brings out all the comforts in automobiling. U. S. and Foreign Patents Pending.

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The Bi-Cal-Ky Auxiliary Spring Co.
866 Prospect Avenue, Buffalo, N. Y.

CYLINDER AND OTHER CASTINGS FOR AUTOMOBILE, MARINE AND STATIONARY ENGINES

Clean, strong and easy to machine.

Best equipment. All work guaranteed.

We Will Quote You Prices F. O. B. Your Town That Will Interest You

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INVINCIBLE No. 620
Voltage—6
Capacity—20 Ampere-Hours
Price $10

The "INVINCIBLE" is strictly an up-to-date ignition battery, high grade in all respects, yet low in price. Made in all sizes.

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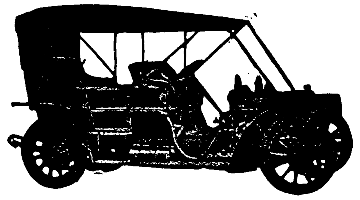

that in fit, style and quality cannot be surpassed, are the kind we make exclusively. Our product talks for us, and we make it tell a good story.

State the name and mode of your car, and we'll give you full particulars.

Springfield Auto Top & Upholstering Co., 102-106 Dwight St., Springfield, Mass.
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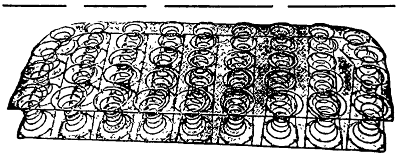
BENEATH the leather and luxurious padding of the majority of automobiles, you will find our

SOFT EDGE CUSHION SPRINGS



That's because manufacturers have learned that this spring has no equal for comfort and wear.

Built in any size or shape desired.

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We Manufacture

WITHOUT DOUBT
THE

Best Transmission Axle

IN AMERICA

Why Not Give US an Opportunity to Prove This?

COVERT MOTOR VEHICLE CO.
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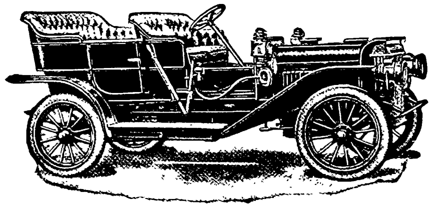

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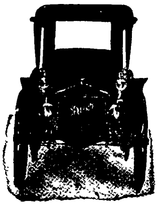
The Duer High Wheeled Runabout

is the best designed, best built and most practical car on the market to-day for seven big reasons, namely:—



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PRICE, $750.00. F. O. B. Chicago

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CHICAGO COACH & CARRIAGE CO.
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AUTOMOBILE
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No. 6

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Best for Sparking

Voltage, 1.6 Volts

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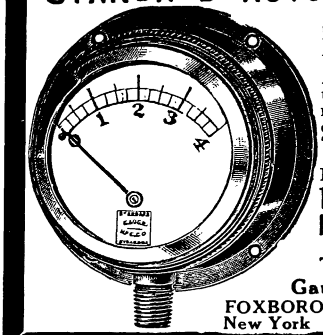

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Wind Shields

VOLTZ BEECHER SCHILDBACK

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Limousine Carriage Mfg. Co.
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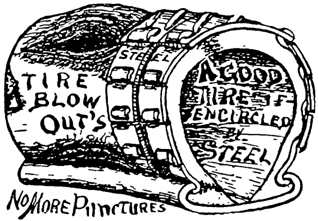

Tires Will Last Forever

Steel Link Bands

Hooks to Rim

You can fix Blowout quick. If tire is completely covered by these clasps, you cannot have Blowouts, Punctures, Rim Cuts or wearing off of tire. As flexible as ever. ANTI-SKID.

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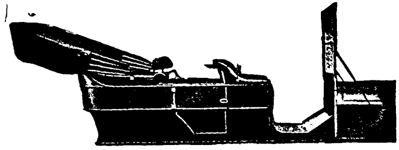
Furnished in the white or Painted and trimmed ready to mount



We are thoroughly equipped to build steel, wood or aluminum bodies in any quantity and it will pay you to see what we can do for you before placing your next contract.

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The life and service of a car depend mainly on its **BEARINGS**

Imported annular bearings used wherever practical insure both long life and service to Corbin owners. Write for 1910 Catalogue C.

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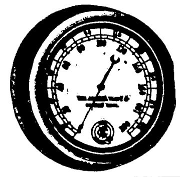

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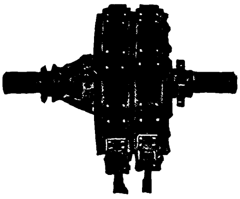

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that have back of them years of experience will produce better results than new and untried devices. Get our prices on any quantity. We've been making them for years.

Planetary Gears for Shaft or Chain Drive. Sliding Gears for Single Chain Drive. Shaft Drive and Double Chain Drive.

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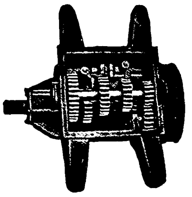

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Auto Cylinder Oil
Will not carbonize. A perfect lubricant
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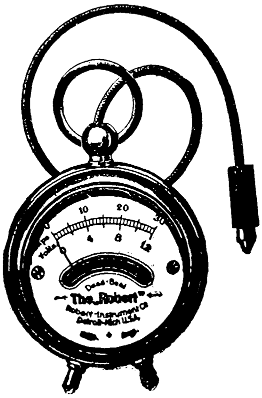

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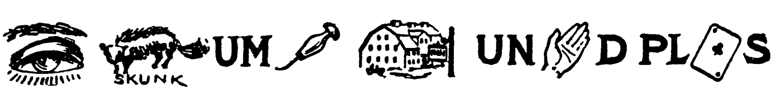

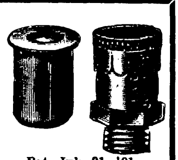

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European Agents, CHARLES CHURCHILL & CO., LONDON, ENG. *SEND FOR SAMPLES*
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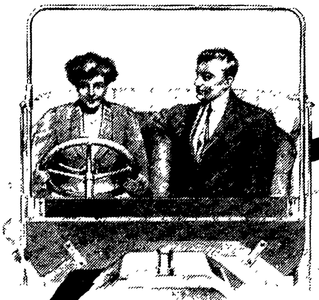

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Union Automatic-Locking Windshield

Modern—The only shield that embodies **all** the up-to-date features.
Simple—Raised or lowered with one hand; no fixtures to adjust.
Positive—Positively stays locked in any position; no rattling.
Durable—No bumpers or springs to wear out; durable lock.
Handsome—No strip across folding line, handsome finish.

No. 1, 41 in. wide, $40.00
No. 2, 44 in. wide, $42 50

Pittsburg Auto Equipment Co.
Sole Distributors
Baum St., Pittsburg, Pa.

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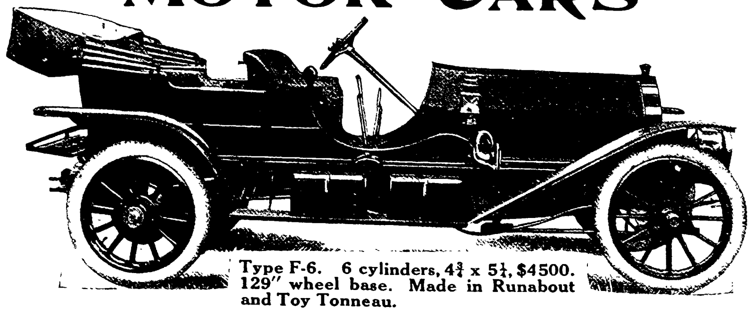
MOTOR CARS



Type F-6. 6 cylinders, 4¾ x 5¼, $4500. 129" wheel base. Made in Runabout and Toy Tonneau.

Type D-25. 4 cylinders, 4½ x 4¼. Price, $2500. 110" wheel base. Runabout, Toy Tonneau and Touring Car.

Type C-50. 4-cylinders, 4¾ x 5½ Price, $3000. 114" wheel base. Runabout, Toy Tonneau and Touring Car.

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There is no better automobile in the world than the "Pennsylvania." Don't fail to examine it at the New York Palace Show, Dec. 30th to Jan. 6th.

There is still some unplaced territory for the right kind of agent.

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All broken parts of automobiles and other machinery can be welded and made as strong as the original without injury to the metal; cast iron, steel, aluminum, etc.; Engine Cylinders, Transmission Cases, and Crank Shafts, etc.

We make a specialty of all broken parts of machinery.

We **machine** and **finish** all castings welded by us.

We have a first-class machine shop in connection with our welding plant.

We build and install both Stationary and Portable Welding Plants.

We contract for manufacturing machinery.

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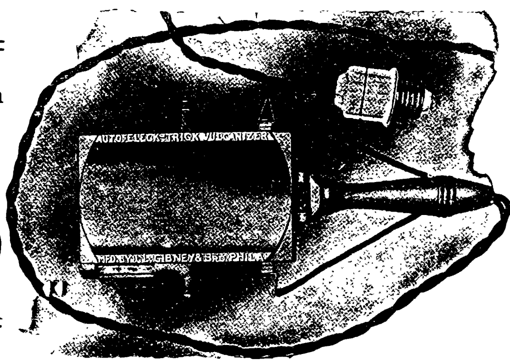
$50 to $100 saved on an investment of $12 ---as saving money is making money

A little of your spare time will do all the tire vulcanizing for which you are paying some repairman $50.00 to $100.00 a year. That's what the interest amounts to on an investment in an

Auto Eleck-trick Vulcanizer

Complete, with Repair Materials

$12.00



For TUBE and CASING PATCHES

It does its work simply and thoroughly. You can't wear it out.

SPECIAL DISCOUNTS TO DEALERS

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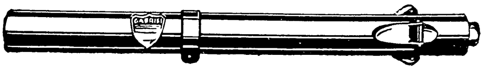
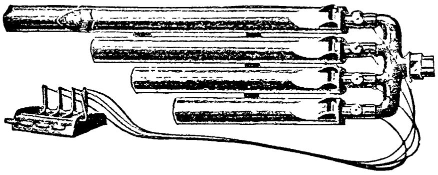
1910
GABRIEL
GABRIEL HORN MFG. CO.
CLEVELAND
1910

THE GABRIEL HORN



The 1910 model has all the valuable features which have made our Nos. 2, 3 and 4 horns so popular, the only change being that the two lower notes are operated together, making a perfect chord, while the high note, which is two octaves higher than bass chord, gives the effect of a soprano voice with a quartette.

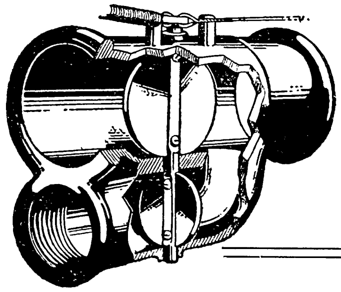


Trumpet Horn

Consists of four single tubes operated individually from keyboard for trumpet or bugle calls or operated in unison for signal purposes.

Special Ten Tube Horn

Has full octave in key of G, with F sharp and A. Operated by a keyboard and all sorts of melodies can be played upon it. Built to order.

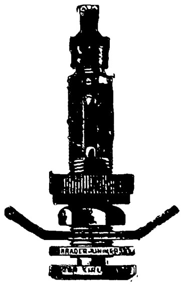


1910 Valve

Like 1909 model, except construction is changed so it forms practically one piece in strength clear through valve—lever is now made from $\frac{3}{8}''$ material. For cut-out purposes remove disc in main channel.

GABRIEL HORN MFG. COMPANY

1412 E. 40th Street, Cleveland, O. **New York Branch, 1926 Broadway**



(Half Size)

ESTABLISHED 1844

Schrader Universal Valves

Trade Mark Registered April 30, 1895

SIMPLE AND ABSOLUTELY AIR TIGHT

Schrader Motor Tire Valves, as shown in cut, are the regular equipment for G & J style Motor Tires, whether used on ordinary rims or demountable rims, such as Michelin or Continental Ready-Flated Tires, and are also used on Hartford Detachable, Fisk Detachable and New Goodyear Detachable Motor Tires.

Our No. 777 Motor Tire Valve is the standard for 2½" and 3" tires, and our No. 725 Motor Tire Valve is the standard for tires larger than 3".

Schrader Universal Valves as shown in cut and in different modifications, are used on all Bicycle tires made in this country. These Valves are supplied to the trade by all Tire Manufacturers. Valve Parts can be obtained from the Tire Makers or from the Manufacturer.

A. SCHRADER'S SON, Inc., 28-30-32 Rose St., New York City, N. Y.

RALACO

The Silent Simplified MARINE ENGINE

NOISELESS ECONOMICAL

FEWER PARTS THAN ANY FOUR-CYCLE ENGINE

BUILT IN SIZES SUITABLE FOR BOATS, FROM 25 TO 100 FEET

2-cylinder 10-15-25 H. P.
4-cylinder 20-30-50 H. P.

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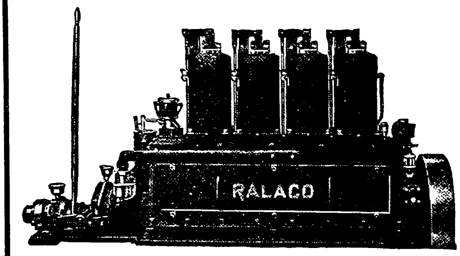
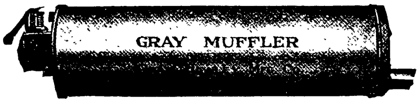


THE S. M. JONES COMPANY
620 Segur Avenue :: :: Toledo, O., U. S. A.

IS IT A GRAY—

OR AN IMITATION?



The Efficiency, Appearance and Demand for the

GRAY MUFFLER

has caused makers of Freakish Catch-Name mufflers to discard their Theories and imitate the Practical and Quiet GRAY.

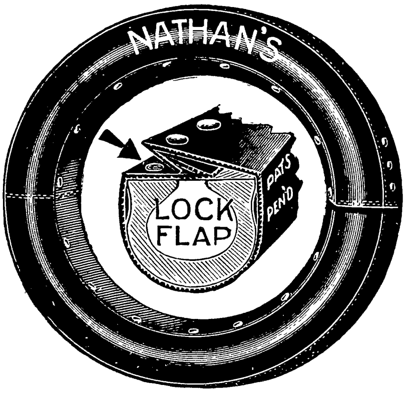
The above shows a Gray model introduced in 1907. Note the cut-out in front head—the collector and tail pipe at rear—note its general appearance and how closely it is NOW imitated.

There's a reason—The GRAY Muffler is Popular. It Sells and gives Satisfaction. All Good articles are imitated, but the Material, Workmanship and Square Dealing which made the Original a Success are not found in imitations. Our 1907 model was right—Service has proven it. Our 1910 is better. It is 3 years ahead of our imitators. Buy the original from the originators and secure the best. The cost is but little more. Write for catalogue, Muffler Department.

GRAY-HAWLEY MFG. CO.
DETROIT, MICH.
Motor Car and Motor Boat Accessories

Nathan's Lock Flap Tire Covers

ARE THE STANDARD



EASY TO PUT ON AND TAKE OFF

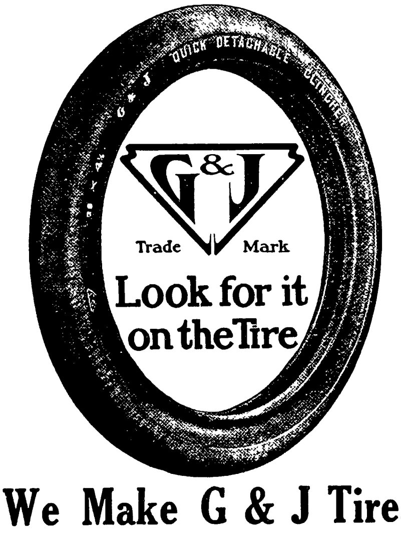
The only perfect fitting Tire Cover that is water and dust proof when placed in any position.

THE LOCK FLAP MAKES IT WATER AND DUST PROOF

Directions:—Simply adjust snugly about tire. Lock the flap and snap the buttons.

Send for new prices. Nathan's Tire Trunks and other fabric supplies are still in the lead.

NATHAN NOVELTY MFG. COMPANY
84 to 90 READE ST., NEW YORK CITY



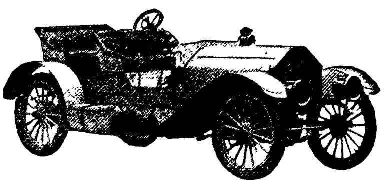
We Make G & J Tires

of a quality that can always be depended upon. They give the kind of service that keeps a tire sold after it leaves the dealer's hands. Automobile owners using

G & J TIRES

have no occasion for complaints. They are always satisfied and good natured.

G & J TIRE CO., :: INDIANAPOLIS



McIntyre

30 horse-power, 112-inch wheel base

$1250

36x3½-inch pneumatic tires. Splitdorf magneto, shaft drive, selective sliding gear transmission

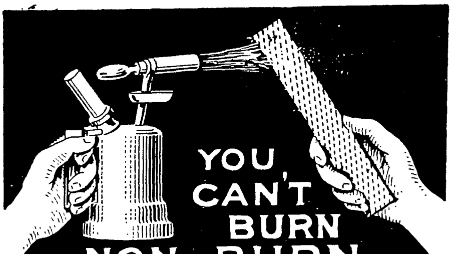
W. H. McINTYRE COMPANY

Auburn, Ind.

Standard Mfrs. A. M. C. M. A.

1730 Grand Avenue **418 Third Ave., So.**
Kansas City **Minneapolis, Minn.**

Canadian Factory, Tudhope-McIntyre Co.
Orillia, Ontario



YOU CAN'T BURN NON-BURN BRAKE LINING

Heat which recently melted the metal boxes in an automobile owned by Maloney & Kratky, Cairo, Ill., did not injure NON-BURN *Asbestos* BRAKE LINING in the least. The flame of a blow torch will not even burn it. If NON-BURN will stand such severe tests, how could heat caused by friction burn it ?

The intense heat caused by friction when stopping an auto quickly chars and burns leather, cork, camel's hair and other organic linings. And after that their gripping power is gone and they soon go to pieces. Rub your hand over a charred piece of any organic lining and see how smooth it is,—bend it and see how easily it breaks.

☛ Write for sample of NON-BURN and put it to any test you like.

H. W. JOHNS-MANVILLE CO.

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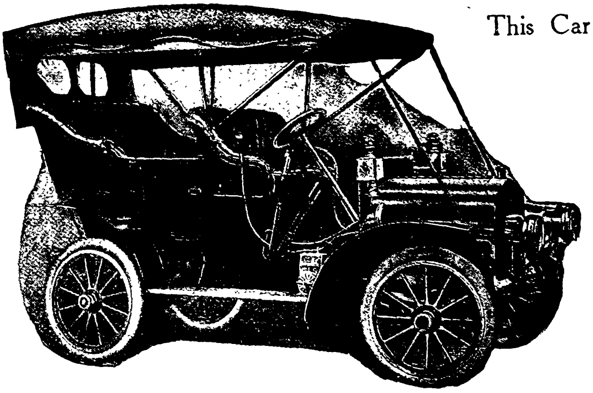
[1050]

H.W.J-M CO.



This Car Assembled Complete with Two Lamps, Wind Shield

$700

Prompt Shipment.

23 H. P. Motor, Shaft Drive

AUTO PARTS CO.

52 & 54 W. Jackson Boulevard
CHICAGO, ILL.

Overland

Model 38
Price, $1,000
Model 40
Price, $1,250

Model 41
Price, $1,400
Model 42
Price, $1,500

There's None Better Built
$1,000 to $1,500

¶ The most efficient motor and the most serviceable car in the motor world. In the Overland you get a combination of the most desirable essentials of the entire motor industry, perfectly assembled. The 1910 Overland motor gives 10 horse power more than last year's motor. It's larger, it has greater piston bore and larger valves, which with our offset crank result in the increased power. Comfort is increased by larger wheels and longer and wider springs. Safety on steep descents is assured by greater brake surface. Everything for comfort, safety, speed and power is in the Overland. You get real road service of the most gratifying kind all the year round, year in year out, in an Overland.

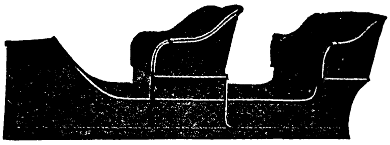
Visit the Overland dealer in your district and let him demonstrate the 1910 Overland to you.

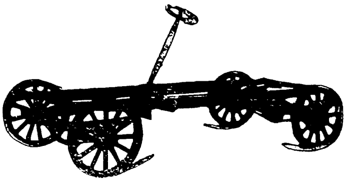
Overland Automobile Co. :: Toledo and Indianapolis

A. L. A. M. *Licensed under Selden Patent*

DO YOU KNOW

That we make pressed steel or angle iron frame gears, with chain or shaft drive, any height of wheels, and any wheel base up to 138 inch ?



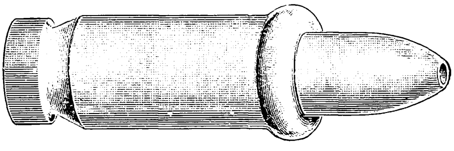


Our Prices will Interest You

We also make bodies, wheels, axles, steering devices and cars ready for power.

BORBEIN AUTO CO., 2109-11 N. 9th St.,
ST. LOUIS, MO.

If you are having trouble with **PORCELAIN CORES**



write us for samples and prices.

THE STAR PORCELAIN COMPANY, Trenton, N. J.

The *"Long-Arm" Products* appeal to those who want the best workmanship and material. That is why we number many of the leading Car Builders among our customers.

We produce, in quantity,

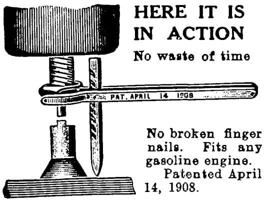
AXLES (Front and Rear).

TRANSMISSIONS, CONE CLUTCHES,

STEERING COLUMNS, etc.

THE "LONG-ARM" SYSTEM COMPANY, - Cleveland, Ohio

Triumph Valve Remover



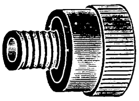
HERE IT IS IN ACTION

No waste of time

No broken finger nails. Fits any gasoline engine. Patented April 14, 1908.

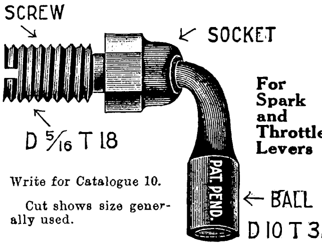
Enables you to remove valve key or valve spring with no side strain or bending of valve stem. List price, $1.00. Discounts to manufacturers, jobbers and dealers. If your dealer cannot supply you, send us P. O. order for $1.00 and the Remover will be sent you postpaid.

We also manufacture **Grease Cups** and other **Gas Engine Specialties, Screw Machine** and **Punch Press Products,** as well as **Various Lines of Machine Work, Tools, Dies,** etc.



Adjustable and Non-Adjustable Ball Joints

for connecting carburetor and timer with levers on wheel steer, eliminating all lost motion and giving a more perfect control to these levers at all times. Easily and perfectly adjustable.



For Spark and Throttle Levers

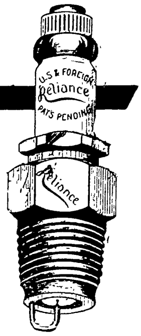
Write for Catalogue 10.

Cut shows size generally used.

List price, steel, 40c. each; brass, 50c. each. Non-adjustable, as per size of cut, 20c. each. Discounts to manufacturers, jobbers and dealers.

MECHANICAL AND ELECTRICAL MFG. CO., R-2227 Prairie Ave., Chicago

Reliance
REG. U.S. PAT. OFF.
SPARK PLUGS
SPARK IN WATER



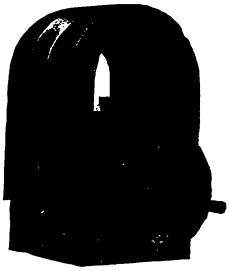
When you Buy-Buy

the one electrically as well as mechanically correct plug—the plug that the man who knows buys. Radically different from the ordinary—will **Spark in Water**—a sure proof that fouling matter has no effect. Endorsed by engineers everywhere.

We want you to know more about Reliance Plugs—we've prepared a booklet on spark plugs and send it for the asking. Our plugs are on sale everywhere—give one a trial now.

JEFFERY-DEWITT CO.
Spark Plug Manufacturers
216 High Street :: Newark, N. J.

S. & F. Stephenson, Agents for United Kingdom,
19 Canning Place, Liverpool, England
Armand Frey & Co., Agents for Continental Europe,
Berlin, Germany



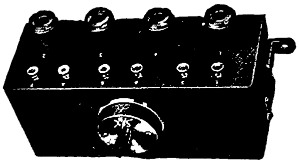
SX

Magneto

The latest invention of a well-known ignition expert.

Especially designed to overcome the difficulties existing in the type of machine heretofore on the market.

Simpliciey is the "keynote" backed up by efficiency.



No half time gears or shaft.

No Distributor.

No lag.

Not affected by moisture.

Same coil for batteries and magneto.

The advantage of a dual system with the equipment of a single ignition system.

You will be interested in a full description.

If you want to know more about it, tell us "to show you."

The Lutz-Lockwood Mfg. Company
Aldene, Union Co., N. J. (P. O., Roselle, N. J.)

J. H. LEHMAN MFG. CO., Inc.
Manufacturers of
Electric Ignition Apparatus for Explosive Engines

OFFICE: 500 FIFTH AVE., NEW YORK, N. Y.

Sole American Agents for

C. & E. Fein
Stuttgart, Germany
MAGNETOS

Berliner Kugellager-Fabrik
Berlin, Germany
BALL-BEARINGS

AUTO-AUTOMATIC WINDSHIELDS

Are designed and manufactured as a strictly high-grade equipment for high-grade cars. Both Straight and Zig Zag Shields are automatic; operate smoothly and easily with one hand, and lock positively in both upright and folded positions. Guaranteed not to rattle or wear loose at any point. Our **Automatic Tilting** shield for **Roadsters** and **large Touring Cars** is the handsomest job that has ever been manufactured.

Write for discount to the trade, or order sample shield for your demonstrating car.

Auto-Automatic Windshield Co.
872 Woodward Avenue Detroit, Michigan

if you carry an M. & M. Quick Repair Outfit.

Punctures repaired anywhere—any time—any place. For M. & M. is instantaneous—positive and self-vulcanizing.

It's reliable too, and you need not be an expert to use it.

THE SUPERIORITY OF M. & M. CEMENT HAS MADE IT THE STANDARDIZED BRAND

—the brand which all automobilists, who want the best, insist upon.

Write direct for literature describing this wonderful preparation.

Your dealer handles M. & M.

Manufactured by

The M. & M. Mfg. Co., Akron, Ohio

V V V

Valentine's Vanadium Varnishes

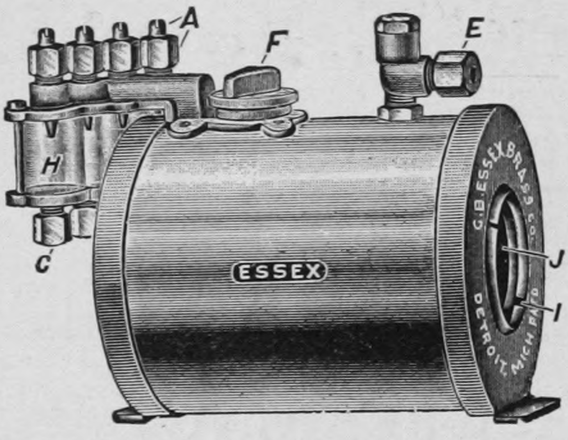
Developed for the needs of the Automobile, its Manufacturers and its Users.
Write to the nearest office for a descriptive price list of Vanadium Varnishes.

Over 80% of all the Exhibitors at the Automobile Shows of the last four years finished with

VALENTINES
VARNISHES

Valentine & Company

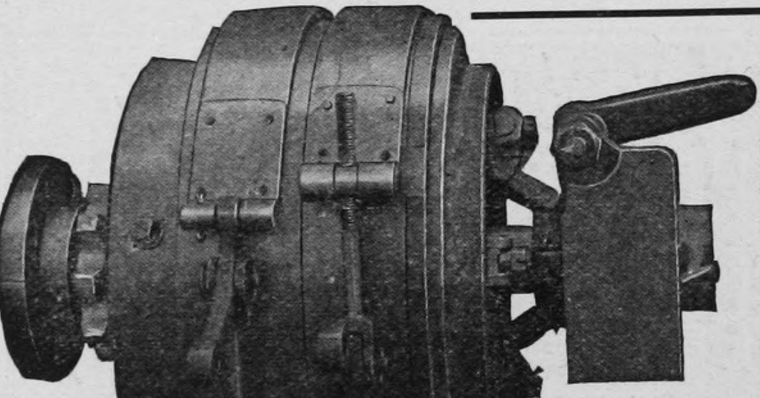
NEW YORK CHICAGO BOSTON TORONTO LONDON AMSTERDAM PARIS



Automatic

Lubrication is the only successful method of lubricating **Automobiles.** **Always ready** and never gets out of **order.** **75,000** in use.

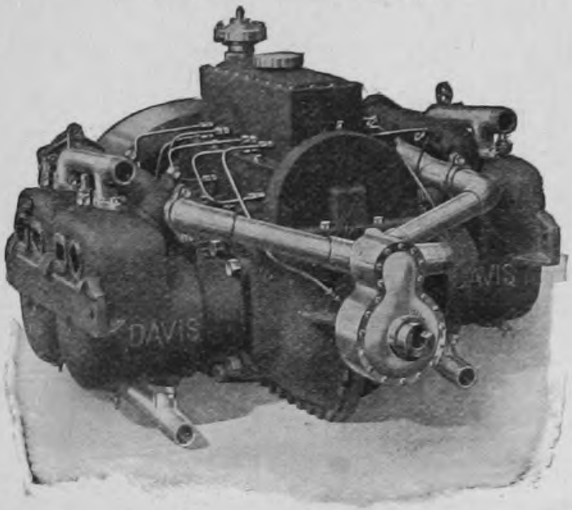
G. B. ESSEX BRASS CO.
DETROIT, MICH.



TRANSMISSIONS AND Horizontal Motors

ANDERSON MOTOR CO.

HERE'S AN ENGINE DESIGNED AND BUILT PURELY FOR TRUCK PURPOSES



4 cyl., $5\frac{1}{2}$ x 5″

Has $2\frac{1}{8}$″ crank shaft and is heavily built throughout. Guaranteed to stand the stresses and strains of commercial vehicle use.

Made Also in Two Cylinder

Send us your order. Our ample facilities will enable us to take care of it promptly.

DAVIS MFG. CO.

MILWAUKEE :: WIS.

Breech-Lock

The name sounds good and the click of the lock when the shield is being lowered or raised is the only noise about the "Breech-Lock."

Vibration tightens the locking device.

It is lowered by pulling a trigger on either side and operated with **one hand**, locking **automatically.**

Special proposition to dealers together with beautiful illustrated catalogue upon request.

Vanguard Mfg. Co., Dept. "C" Joliet, Ill.

Branch, 1427 Michigan Ave., Chicago, Ill.
Vanguard Co. of New York, Eastern Distributors

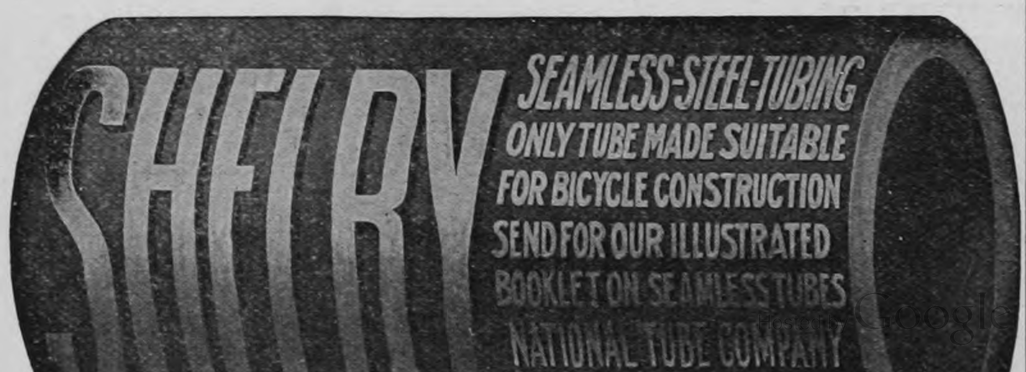
CENTURY SINGLE PHASE MOTORS

Are self starting under full load, and are automatic in operation. They are adapted to the operation of any apparatus requiring a constant speed, and particularly the operation of Pumps, Air Compressors and Generators for Charging Storage Batteries.

We build in standard horizontal, vertical and back geared types, $\frac{1}{4}$ H. P. to 30 H. P. for any commercial frequency and voltage.

CENTURY ELECTRIC CO., MAIN OFFICE AND WORKS: 19th & Olive Sts., St. Louis, Mo.

New York Office:—30 Church Street



For the convenienc of customers desiring immediate delivery, stocks of Shelby Seamless Steel Tubing are kept in many large cities; th location of stock nearest to any specific point will be advised on request.

District Sales Offices

ATLANTA
CHICAGO
DENVER
NEW ORLEANS
NEW YORK
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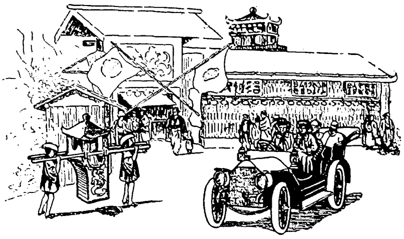


IF YOUR MOTOR WON'T RUN, might as well go back a hundred years to the sedan chair. Lasting damages and most annoying delays come with the use of poor lubricating oil. Take no chances. USE

"Best for YOUR Engine."

MONOGRAM OIL

Manufactured Solely by

The Columbia Lubricants Co. of N. Y. :: 116 Broad St., N. Y. City

MONOGRAM OIL is sold at all garages

Packard CABLE

ALWAYS MAKES GOOD

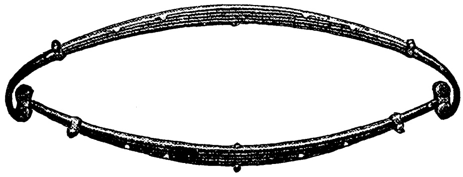
It delivers the entire energy of the spark coil—**and continues this performance indefinitely.** It has no equal.

THE PACKARD ELECTRIC CO. Booklet (in colors) on request **300 Dana Ave., Warren, Ohio**

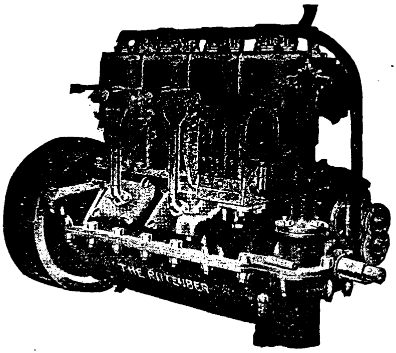
Liggett Spring & Axle Company

PITTSBURG, PA.

MANUFACTURERS OF AUTOMOBILE PARTS



- SPRINGS, CARBON or ALLOY STEELS
- ROLLER BEARING AXLES
- UNIVERSAL JOINTS, TRANSMISSIONS
- TANK STRAINERS, PIPE STRAINERS
- PIPE COUPLINGS



RUTENBER FOURS AND SIXES

The most popular automobile motors on the market because of their unvarying excellence, power and reliability. Made in the following models:

4 cylinder, 4 x 4, 25-28 H. P.
4 cylinder, 4½ x 5, 30-35 H. P.
4 cylinder, 4¾ x 5, 40-45 H. P.
6 cylinder, 4½ x 5, 50 H. P.

Each model equipped for magneto attachment and all except the 6 cylinder fitted with oil-pan base.

Get Your Orders in Early

Western Motor Co., Factories: Logansport, Ind.
Marion, Ind.

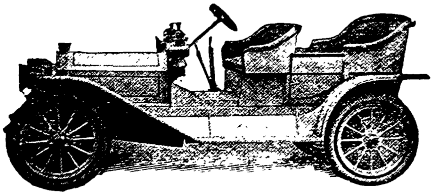
SEAMLESS TUBING

BRASS and COPPER

Prompt Delivery
Best Quality
Best Price

BUFFALO TUBE CO.
257 Rano St., Buffalo

Crawford.



Model H, Light Touring Car, Rutenber 25 H. P. Motor, Price, $1300
Continental 28 H. P. Motor, Price, $1350

¶ The dealer who is anxious to handle a reliable, dependable car will find what he wants in the CRAWFORD. Ample manufacturing facilities, combined with long experience enable us to give better value at a lower price, with the result that the CRAWFORD is a ready seller.

FOUR MODELS

Model "F," 50 H. P., 7 passenger, $3250
" "D," 25 H. P., Runabout, 1250
" "H," 25 H. P., Light Touring Car, 1300
" "G," 40 H. P., Touring Car, 3000

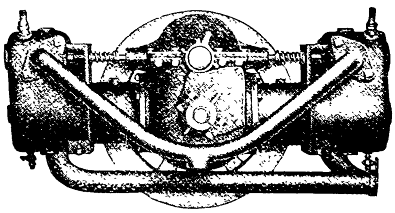
CRAWFORD AUTOMOBILE CO.
HAGERSTOWN, MD.

IT'S NO PROBLEM

to select the best motor for your new cars. Nearly everybody knows that

THE BEILFUSS

is the most powerful, simple and reliable engine of the 4-cycle type made.



AIR AND WATER COOLED

Air-cooled, 10-12 H. P.
Water- cooled, 10-12 and 18-20 H. P.

Give us information concerning your product and let us figure with you.

The Beilfuss Motor Co.
LANSING :: :: :: MICH.

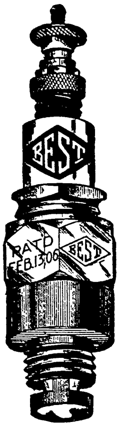
When writing please mention this publication.

THE

BEST
TRADE MARK

SPARK PLUG

PATENTED
Patent Applied for, MARCH, 1902
(other patents allowed)
(other patents pending)



MORE PROOF

October 8th, 1909.

Best Ignition Equipment Co.,
200 W. 64th St., N. Y.

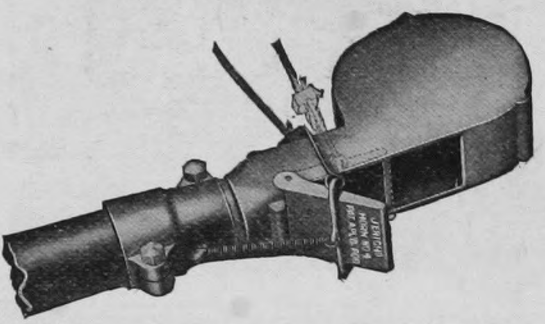
Gentlemen:
You sent me 1—⅞ " Best " Spark Plug some time ago and it has given perfect satisfaction. I have tried several other makes and they all short-circuited with oil. The " Best " Spark Plug is the only one that has stood up and given satisfaction.
Send me another, and oblige,
Yours very truly,
W. H. Storey.

These plugs were designed primarily to give reliable service under any and all motor running conditions.

The Best Ignition Equipment Co.
200 W. 64TH ST., - NEW YORK

JERICHO

The Road Clearer



Blown by the Exhaust

Cannot clog. Requires no cut-out

4 Sizes: $7, $8, $9, $10

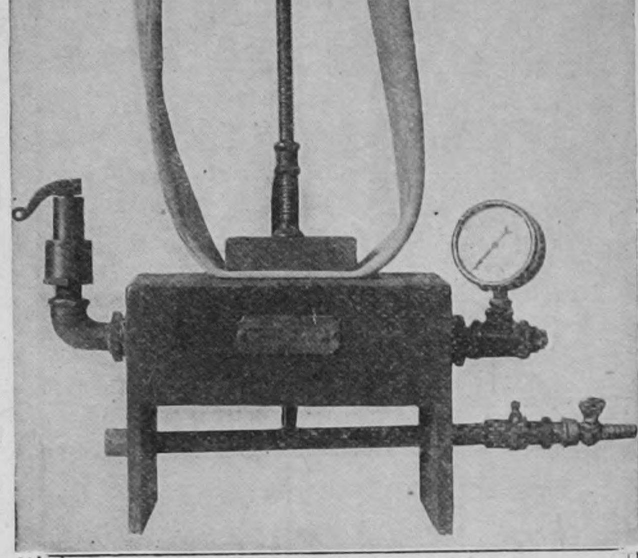
Booklet 24 on request.

Ask your dealer or send make and model of car to

The Randall-Faichney Co.

SOLE MAKERS

BOSTON :: :: U. S. A.



SOMETHING NEW

Steam Vulcanizer for garage and private use. Very cheap and easy to operate; will cure three tubes at a heat. Will not burn tube while being cured. Complete outfit consisting of rubber, backing, stitcher, shears, cement and clamp. For information write.

KERR-GRIFFIN VULCANIZER CO.
5919 Penn Ave., Pittsburgh, Pa.

Agents Wanted

Oberdorfer Type "B" Pumps for Gray Motor Co.

5,000 for 1909
10,000 for 1910
═NUF SED═
WRITE FOR CATALOG

M. L. Oberdorfer Brass Company, Syracuse, N. Y.

Invader
Oil
For Automobiles
Chas F Kellogg & Co

INVADER OIL

INVADER CYLINDER OIL (the Pioneer light oil) positively eliminates the many undesirable features so common with ordinary oil. Give **Invader Oil** a fair trial—your motor will show its appreciation. "Be sure it's **INVADER,** then go ahead."

You name the car, we'll name the grade.

INVADER GEAR OIL is the crowning triumph of 28 years' experience in the lubricating field. It is of superior quality, scientifically manufactured, and is the ideal lubricant for **transmission** and **differential** gears.

Its use insures longer life to your gears and reduces friction to a minimum.

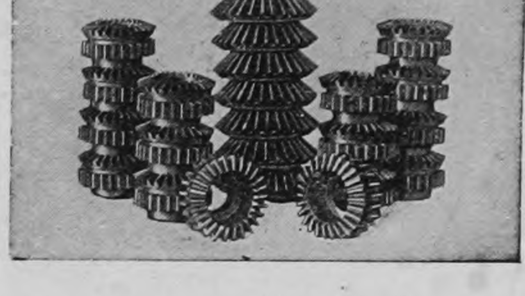
Invader
Gear Oil
For Packard Timing Gears
Invader
Gear
Oil

Hayes Wheel ayes Wheel Co.

WHEELS

¶ We are the oldest Auto Wheel Builders in the country, and, having all new improved Auto Wheel Machinery, we are able to produce the most perfect wheel on the market. Kindly allow us to send you a sample set and also to explain our methods.

HAYES WHEEL COMPANY, JACKSON, MICHIGAN
American Distributing Company, Sales Agent
JACKSON, MICHIGAN

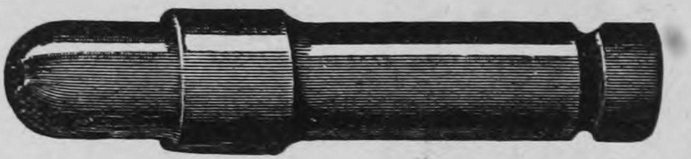


Prepare For
1911

We are now closing contracts f
gears for 1911 delivery. Manufa
turers who had trouble securing th
quantity of gears required for 191
will see the wisdom of covering ear
on at least a part of their probab
requirements.

THE
NewProcessRawHideC
SYRACUSE, - - New Yo

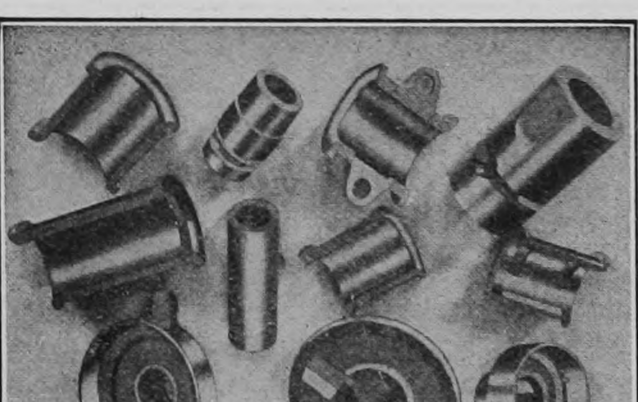
IMPERIAL PORCELAIN SPARKING TUBES



MANUFACTURED BY

The Imperial Porcelain Works, Trenton, N. J.

When desiring quotations always send sample or drawing of style required

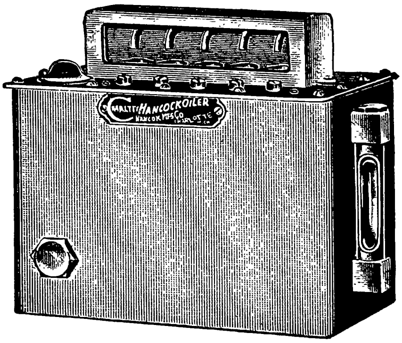


Finished Metal Castings of Superi
Tensile Strength from Superior Allo

Thirty Years' Experience in Compounding All

Finished Die Moulded Bearing Bushings for Gaso
Engines our Specialty; also Timer Parts—in f
everything that you are now using cast from br
Our Die Castings need no filing, fitting or machini
but are ready for assembly when leaving our facto
Manufactured by our new and improved vacu
process.

E.B. Van Wagner Mfg. Compa

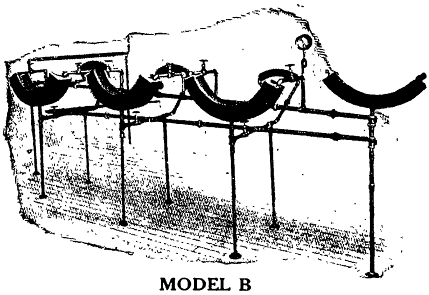


The Hancock Valveless Oiler

is simple in construction and positive in action. It will always give your bearings a reliable supply of oil—never too much, never too little. It will help you cut down your oil bills.

DON'T YOU WANT A CATALOG?

HANCOCK MFG. COMPANY
776 E. Henry Street 20 **Charlotte, Mich.**


MODEL B

AUTO TIRE VULCANIZING

with the

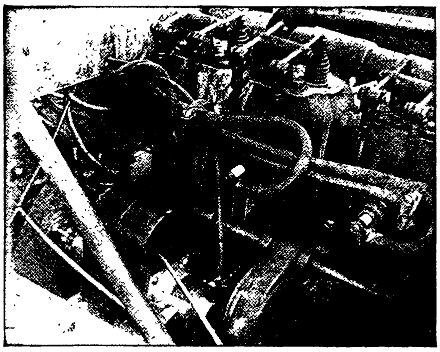
MARBLE-HAYWOOD PLANTS
RETREADING PLANTS

Model A, $250; B, $200; C, $150

"E" The new model, all classes of work, both casings and tubes. Has a self-contained gas-burning boiler. **A Complete Plant** $80.00

"F" The new tube repair outfit. Tube-arm four feet long with casing repair attachment. Has self-contained gas-burning boiler. Write for Catalog. $35.00

M. E. HAYWOOD MFG. CO., 332 N. Illinois St., Indianapolis, Ind.



BRING your Buick model 10 runabout up to date and improve its operation with an M. & S. magneto. Full ball bearing, absolutely guaranteed, and

The Price is only $35.00.

You can install it yourself.

Mavity-Sleeper Company

123 Fifth Street, Fowler, Indiana

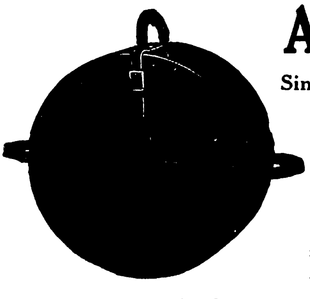
Auto Trunks

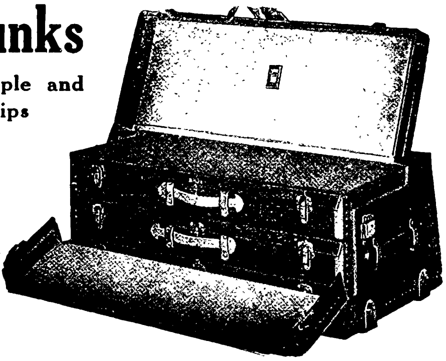
Single, Double, Triple and with Inside Grips

Write for Special Catalog

Manufactured by

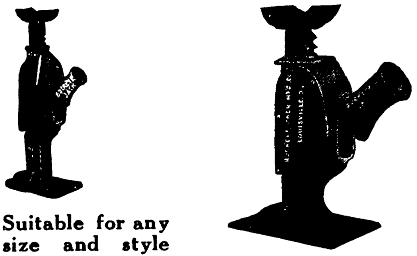
W. W. Winship
69 Summer Street
Boston, Mass.


Round-tire Trunk
Arranged for Hats, or Plain for Inner Tubes



Buckeye Jacks

in all sizes



Suitable for any size and style Automobile made. For cars weighing from 500 to 8000 pounds. The largest variety of sizes made by any jack manufacturing company in America.

Style	Capacity	Height Bar Down	Raise of Bar	Height Bar Raised	Weight Pounds	Size of Base
No. 0	1 Ton	12″	6″	18″	9	3¾x5¾″
05	1 Ton	12″	6″	18″	9	3¾x5¾″
02	1 Ton	12″	6″	18″	8¾	3 x5⅛″
01	1 Ton	8¾″	5″	13¾″	8¼	3 x5⅛″
01	1 Ton	9¼″	5″	14¼″	8½	3¾x5¾″
03	1 Ton	10″	6″	16″	5	2⅝x4½″

THE BUCKEYE JACK MFG. CO.

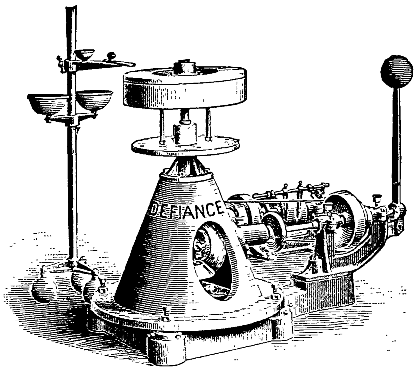
LOUISVILLE, OHIO

"DEFIANCE"

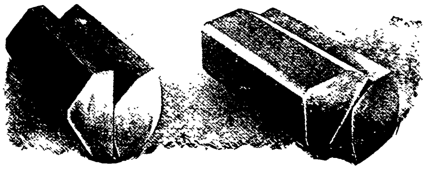
Patent Automatic Machinery for making Automobile Wheels and Bodies. Also labor-saving machines for producing Hubs, Spokes, Wheels, Wagons, Carriages, Rims, Shafts, Poles, Neck-Yokes, Single Trees, Hoops, Handles, Spools, Bobbins, Insulator Pins, Oval Wood Dishes and for General Wood Work.

Invented and built by

THE DEFIANCE MACHINE WORKS, Defiance, Ohio



MOTOR FLY WHEEL BALANCER



The Joints of The Morse Chain

Are composed of a two-part pintle, one rocking on the other, sliding friction being entirely eliminated, thus greatly reducing the wear on the joint.

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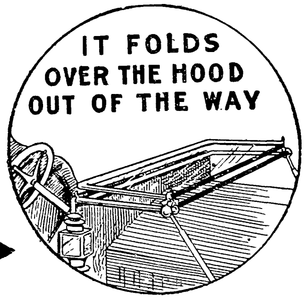

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"The Aristocrat of Wind Shields"

Leaves the driver's vision *clear*, dividing bars being *below* the eye-line. Folds *flat* over the hood—*very* compact. Up in a *jiffy*—down *quicker*—all with *one* hand. Patent catches *prevent* breakage if folded too hurriedly. Sold under a *life-long, anti-rattle, perfect* construction guarantee.

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Territory Is Going FAST

UNIVERSAL WIND SHIELD CO.
135 So. Clinton Street :: :: Chicago, Ill.

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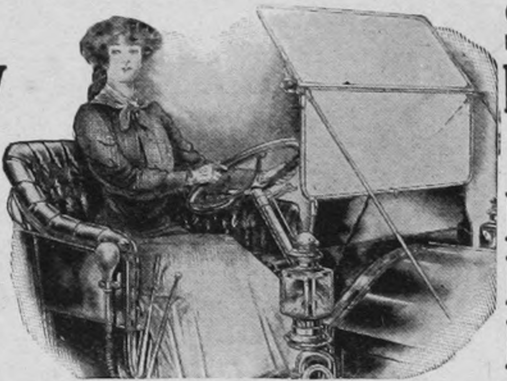
Model No. Fourteen

A SPECIAL, LIGHT, ALL-BRASS AUTOMATIC

WIND SHIELD



IN THE TILTING POSITION

Three positions,—all automatically acquired. The Tilting Position diminishes wind resistance and gives a rakish look to the outfit which is much affected by those who regard snappy lines of designment along with practicability.

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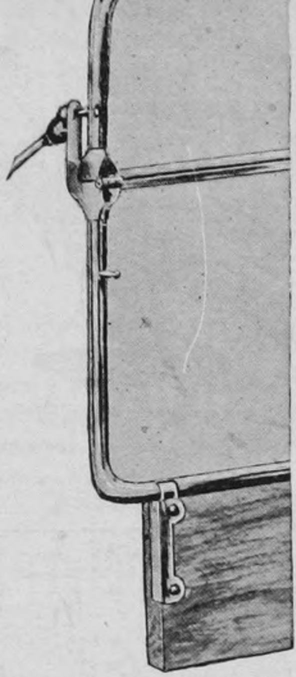
The Troy Carriage Sunshade Co.

TROY, OHIO, U. S. A.



Sectional View

Self-Locking FOLDING WIND SHIELD

Easy to operate. Light in weight. Made of Brass and Glass. No bolts, nuts or clamps to adjust. Durable and handsome. Reasonable in price.

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Metal Stamping Co.

30-50 Hubert St., New York

Write for Catalogue, showing our full line of Automobile Specialties.

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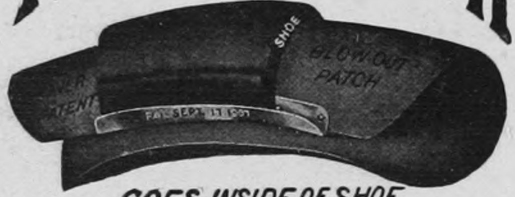

GOES INSIDE OF SHOE

Made of FABRIC and Rubber, like an AUTO SHOE; with a brass flange that prevents it from "CREEPING."

YOU NEED NOT CARRY EXTRA SHOES if you carry Traver Patches.

THE ONLY road repair for a RIM CUT; THE BEST in the World for a BLOWOUT

DON'T THROW WORN SHOES AWAY Traver Patches Make Them Serviceable

A MONEY-SAVER for the OWNER A TROUBLE-SAVER for the CHAUFFEUR

FOUR SIZES

No. 0—For shoes 2½ and 3 in.	$2.50
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Three Styles: CLINCHER—DUNLOP—FISK State Size and Style required.

For Sale by All Dealers, or Sent Anywhere in the United States upon receipt of price.

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Automobile Tires

Clincher and Quick Detachable

All New Goods, all High Grade Makes. Money refunded at once if dissatisfied on receipt of goods.

	SHOE	TUBE
28 x 3	$10.00	$2.65
30 x 3	13.90	2.90
30 x 3½	16.75	3.90
32 x 3½	19.50	4.25
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32 x 4		4.90

Tire Lugs, all sizes, each	.15
3 in. Cross Chains, to fit any make of Tire Chain Grips, per doz.	.45
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FREE 1c. invested in a postal will bring our No. 94 Bargain Sheet, which will save you many dollars on auto supplies.

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IGNITION ABSOLUTELY SURE

RAJAH AUTO SUPPLY COMPANY

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(Watsessing Station, D. L. & W. R. R.)
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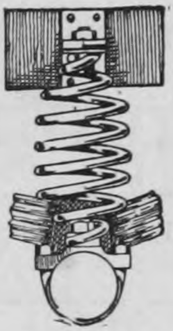

Accept the Say-So of manufacturers who have used thousands that Sager Equalizers have no equal.

They prevent the breaking of springs and axles; cushion engine and make riding a luxury.

OVER 40,000 IN USE

"We are entirely satisfied with them."—ELMORE MFG. CO.

"The 'Sager device' presents advantages not found in other so-called 'shock absorbers.' "—OLDS MOTOR WORKS.

"They add greatly to comfort and reliability."—CRAWFORD AUTOMOBILE CO.

"We find them indispensable."—LOGAN CONSTRUCTION CO.

"Our customers are more than satisfied with them."—DORRIS MOTOR CAR CO

"Have given us excellent satisfaction."—THOMAS B. JEFFERY CO. (Rambler.)

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"A great benefit and we cannot speak too highly of them."—THE JEWEL MOTOR CAR CO.

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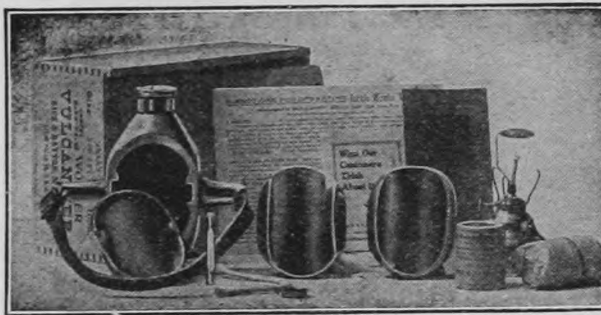
Write to-day for full particulars.

J. H. SAGER CO., 263 South Ave., Rochester, N. Y.



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Cedar Falls, Iowa

Makers of

Little Wonder Vulcanizers

We challenge the world on making perfect repairs on all parts of different sized automobile tires. The new 1909 model Little Wonder Vulcanizer is just out. It is the best thing on the market and is guaranteed to give satisfaction. YOU can operate it. Are you paying too much for automobile supplies? Ask us for our Auto. Supply Catalog. It is an EYE-OPENER.

Let us hear from you; we want your business and know we can please you. Write to-day.

Rice & Dayton Mfg. Co.

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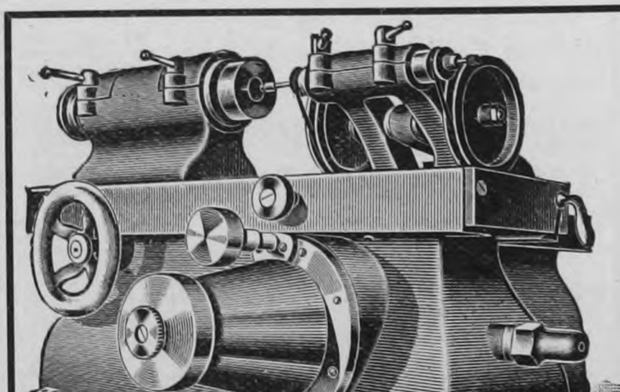

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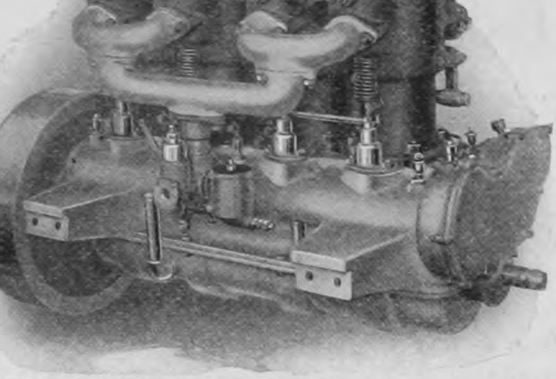
Have you any
INTERNAL GRINDING
or CUP and CONE GRINDING

to do? If so, write us for particulars of our Grinders.



4-30 AUTOMOBILE TYPE, 4½ in. x 5 in.

MOTORS

Individual Cylinders. Jump Spark Ignition. New Double Jet Carburetor. Unusually Big Bearings. Perfect Workmanship and Finish.

OTHER SIZES FOR ALL PURPOSES

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Try what a REAL top maker can do

Quality Automobile Tops

Consider it an Experiment if you will
But please remember it is an Experiment **At Our Risk!**

More Value
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CHAS. P. McCLELLAN

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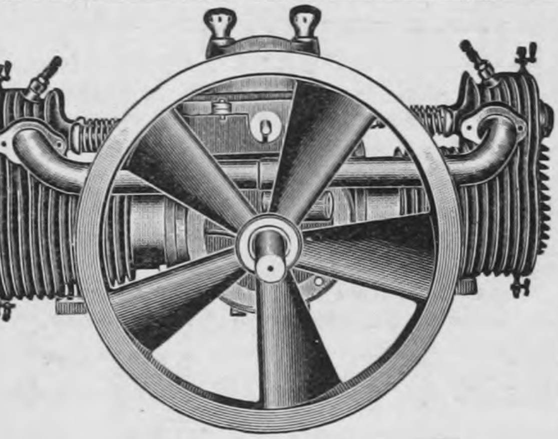
Samples and prices upon application



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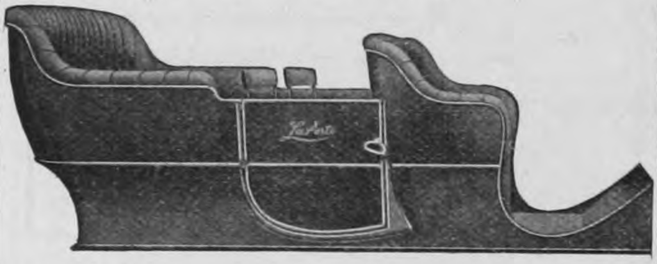
uilt in sizes 4½ x 4¼, 4¾ x 4¾, x 4¾ and 5 x 5, air or water ooled.

Catalogue for the asking

LaPorte BODIES

First-class Bodies, either wood or metal, painted and upholstered complete.



We can furnish dashes in Mahogany, Walnut, etc., brass trimmed or plain.

ROADSTER BODIES and AUTOMOBILE TOPS

A SPECIALTY

LaPorte Carriage Co.

NON-EXPLOSIVE

"NEW JERSEY"

LIQUID METAL POLISH

¶ A lightning cleanser, producing a polish of elegant and lasting finish on all metal work, whether hot or cold, in all conditions of heat or cold, such as brass, nickel, tin, copper, zinc; also brass, zinc and nickel signs, railings, harness trimmings, &c. It will not stain or deface wood work.

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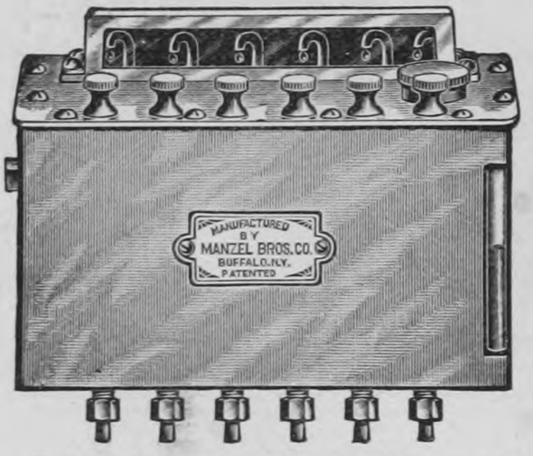

For lubricating the cylinders and bearings of all kinds of Gas and Gasoline Engines.

- Feed always in sight.
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- Easily regulated.
- Positive.
- Any number of feeds.
- Rotary or Ratchet Drive.

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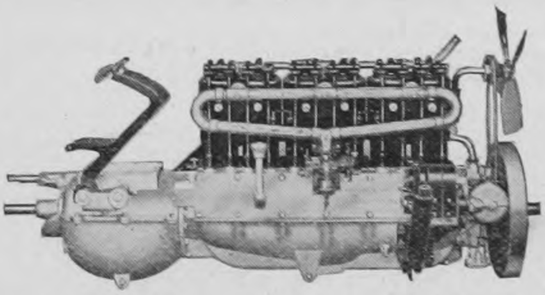
320 Babcock St., Buffalo, N. Y., U. S. A.

The "Brownell Motor"



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Stands for BEST throughout in type, design, proportions, material and workmanship. Nothing has been neglected.

Our three-point suspension Unit Power Plant, the ideal outfit for the Automobile Assembler,

HAS NO EQUAL

Built in several sizes from 3½-inch bore by 4-inch stroke, up — in 4 and 6 cylinders.

Heavy Motors and Transmissions for trucks up to 5 tons capacity

A POSTAL :: A CATALOG

The MESINGER Re-bound Check Spring

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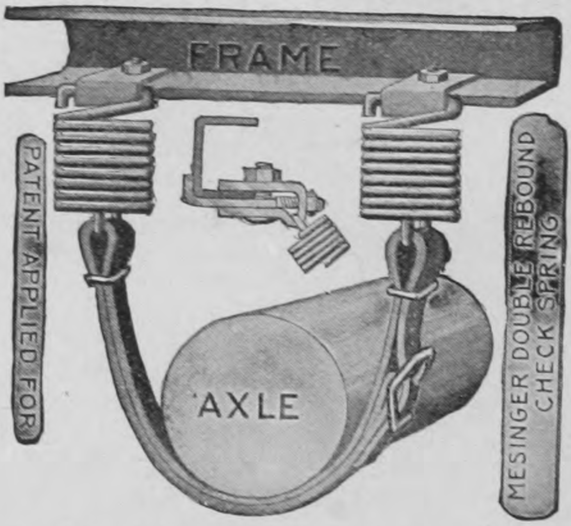
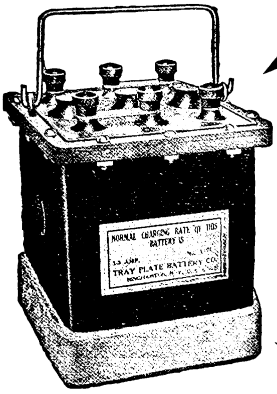
IMPROVED CLAMP guaranteed to hold tight. No holes to drill. Anybody can attach.



The Mesinger Re-bound Check Spring does not Defect or Dam pen the Free Action of the Main Spring. They check the Re bound evenly, in a pleasing motion and prevent breaking off th spring. We refund the money if not satisfactory.

No. 1, for Runabouts, single, $3.00; double, $4.50



6 Volts, 60 Amperes

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"High Efficiency Batteries"

Actually Give

Greater Results and Hotter Spark

than other batteries

1200 to 1500 Miles on Our No. 660

1902 1909 TRAY PLATE BATTERY COMPANY 1902 1909

24 Wall St., Binghamton, N. Y.

A NEW ERA BEGAN IN AUTOMOBILE BEARINGS

When in July, 1907 there were manufactured in this country

100 FINISHED CASTINGS *of* PARSON'S WHITE BRASS

per month. We made them in July, 1909. We are making over 500 per hour. A few others are being made, but they somehow do not seem to go. Inquiries accompanied by blueprints will be promptly and intelligently answered.

WETHERILL FINISHED CASTINGS CO., PHILADELPHIA, PA.

Aluminum, Bronze, Manganese Bronze

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25 YEARS' EXPERIENCE

ROCHESTER
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FROM ROUND AND SQUARE WIRE, OR FLAT STOCK; ANY SHAPE SPRINGS DESIRED ARE MADE TO ORDER FROM SAMPLES OR SPECIFICATIONS, BY

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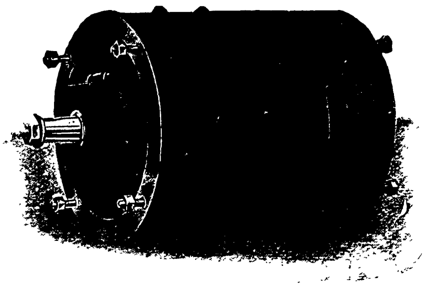

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Automobile and Power Wagon
Motors

Designed to meet every construction of vehicle. The automobile differ from the power-wagon motors, each type having qualities with special reference to their intended applications.
Full particulars in Circular 1059.

Westinghouse Electric & Mfg. Co.
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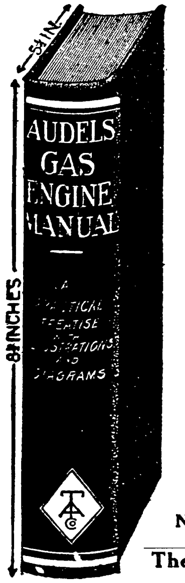
GAS ENGINE MANUAL


5½ IN.
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AUDELS GAS ENGINE MANUAL
A PRACTICAL TREATISE WITH ILLUSTRATIONS AND DIAGRAMS

¶ This volume, just published, gives the latest and most helpful information respecting the construction, care and management of **Gas, Gasoline** and **Oil Engines, Marine Motors** and **Automobile Engines,** including chapters on Producer Gas Plants and the Alcohol Motor.

¶ The book is a practical educator from cover to cover and is worth many times the price to any one using a gas engine of any type or size. Contains 512 pages, 27 chapters, 156 diagrams, size 5½ x 8½ inches, weighs 2 pounds, handsomely bound, and in every way a fine volume.

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THE LODGE & SHIPLEY MACHINE TOOL CO.
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FOR AUTOMOBILES
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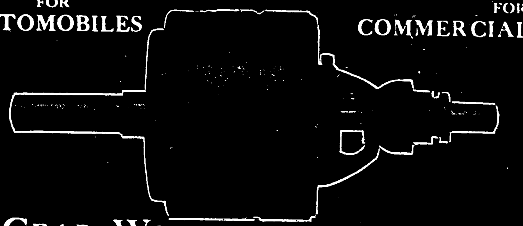

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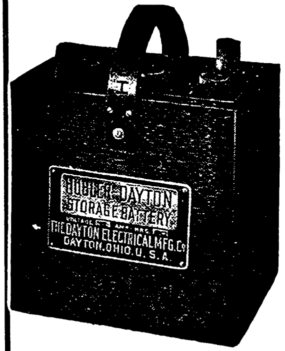

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Get a battery that you can depend on. The

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is guaranteed to give perfect service; you can get more miles of running out of it than any other battery made. We also make the famous Apple Ignition Dynamo, and many other ignition necessities.

Our catalog is interesting and instructive. Write for a copy today.

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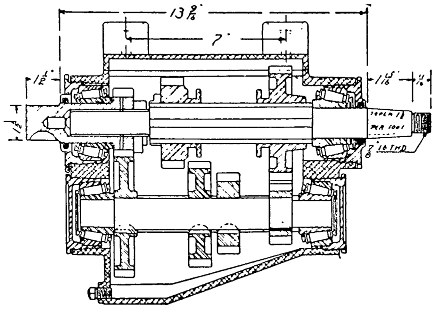

Five styles of selective transmissions for 1909-10; also **selective and progressive side levers; cone clutches,** bronze or leather face, with or without cork inserts; **Universal joints; steering gears;** and **brass plating done to order. We make parts to your designs** and are designing new parts for 1910. **We make a specialty of gear cutting** where blanks are furnished.

Write for catalogue and prices.

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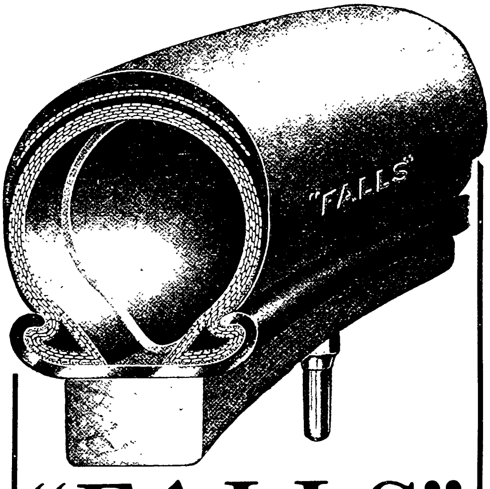

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Automobile, Bicycle and Motor-Cycle Tires represent the highest degrees of efficiency. Write for Catalog "A."

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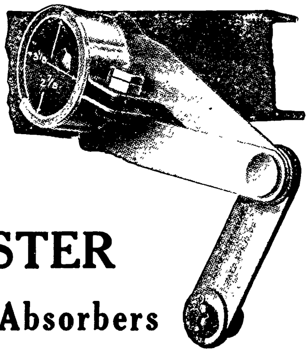
To get real satisfaction and pleasure out of your car, equip it with



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Shock Absorbers

the kind that allow free play to springs over good roads and smooth pavements, but get busy when you strike the bumps. Built on right principle; bind gradually, going up and coming down.

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When contracting for STEERING GEARS take advantage of years of experience in the building of this part of your car.

We Have 50,000 square feet and thousands of dollars' worth of special machinery for the manufacture of steering gears.

We Make every part, from the wheel to the ball arm.

Therefore we guarantee deliveries our customers can depend upon.

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ALLEN TIRE CASE
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"We Couldn't Improve the Case, so we Improved the Bag"

The new ALLEN TIRE CASE bag is a distinct improvement. It is just what you've been looking for. Note in the illustration its handsome appearance, neatness and compactness. The size is quickly and easily seen on the label, no matter where you keep them. It "stacks" evenly and solidly on the shelf. You can't damage it by handling.

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You will notice that the motorists who have any doubts about this statement are the ones who have never given

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X. L.

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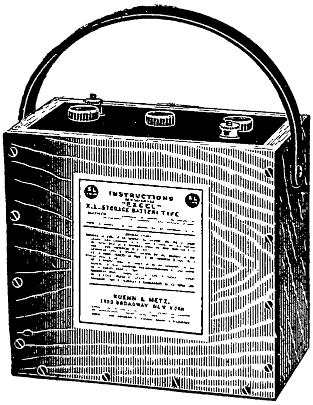
Excel all others



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Guaranteed to be Satisfactory.

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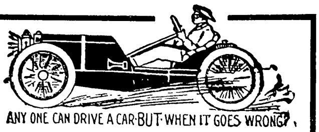

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Our Models actually Work.

Our Lesson Pamphlets and Charts are perfectly simple.
Everything sent at one time in a neat box.

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Master the Automobile With

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With Dyke's System of WORKING MODELS that actually work and our 24 simple LESSONS and CHARTS we guarantee to teach you the subject thoroughly.

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This is positively the only course in the world that can be successfully taught by mail.

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A SHOP MAN writes that he learned more in a short while studying our course than years of work around the shop.

ONE OF OUR CUSTOMERS is now running a repair shop.

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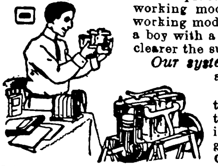

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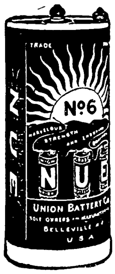
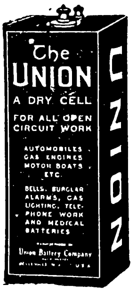
The Ones You Now Use Can't Equal These



NUE, a high-grade Battery for ignition work, constructed on entirely different lines than any other cell made. It has a guarantee of 34 amperes with less depreciation than the cell you are now using. A good, fat, hot spark always assured by their use.

THE UNION Dry Cells are made to withstand the great consumption of current used by the average coil. They stand up under all conditions and will give perfect satisfaction with long life and great energy. Ask your dealer or send direct for booklet.

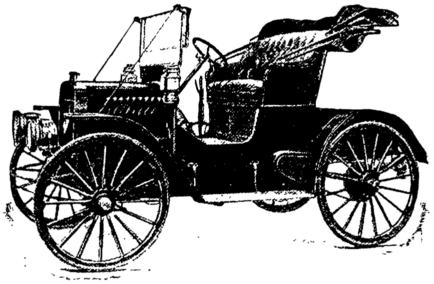

The UNION
A DRY CELL
FOR ALL OPEN CIRCUIT WORK
AUTOMOBILES, GAS ENGINES, MOTOR BOATS, ETC.
BELLS, BURGLAR ALARMS, GAS LIGHTING, TELEPHONE WORK AND MEDICAL BATTERIES
Union Battery Company
U S A
UNION

UNION BATTERY COMPANY
BELLEVILLE, N. J.

H. H. BABCOCK COMPANY

WATERTOWN, NEW YORK

65 Years' Reputation Behind It



NOT A MOTOR BUGGY

but a solid tired Automobile. Freedom from tire and mechanical troubles is the result of owning a **Babcock.** Built only for those willing to pay for quality and workmanship. If you are looking for an automobile at buggy price, don't write us. Otherwise write us for further information and printed matter.

WITH OR WITHOUT GOLD INITIAL

Grinnell
"Rist-Fit"

AUTO GLOVES

With or Without Gold Initial

are the ideal Automobile Gloves for winter.

The "Rist-Fit" is an exclusive feature. It is patented and found in no other Auto Glove. A "V" of soft leather is set into the cuff, giving a close, smooth fit at the wrist, with one pull of the strap or woven tape. The gauntlet never sags and all wind, snow and dirt is excluded.

For fall and winter the **Grinnell "Rist-Fit" Auto Gloves** have large roomy cuffs, readily admitting the largest coat sleeve. Warmly lined with eiderdown, camel's hair knit glove, lamb skin, squirrel, etc.

GET A PAIR ON APPROVAL

Examine a pair of these gloves at our expense —just send us your dealer's name, with the size and style you prefer and a pair will be promptly sent you prepaid. For men and women.

MORRISON-RICKER MFG. CO.

70 Broad Street, Grinnell, Iowa

Originators and Patentees of Ventilated and "Rist-Fit" Gloves.

Rivets and Escutcheon Pins

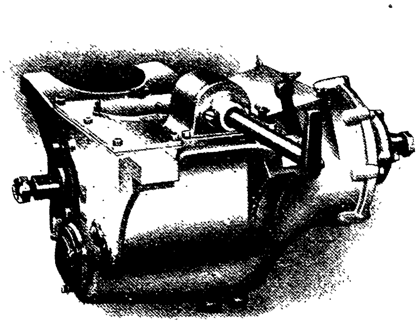
Made in
All Metals
and
Plated in
All Finishes

JOHN HASSALL, Inc.
No. 411 Oakland St., Brooklyn, N. Y.

ESTABLISHED
1850

1910 TRANSMISSIONS AND PARTS

"QUALITY SPEAKS FOR ITSELF"



"SELECTIVE SLIDING"—35 and 50 H. P.

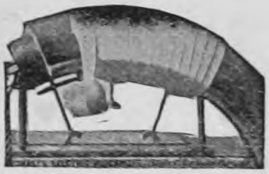
Unit Power Transmissions

The Multiple Disc Clutches are made from tempered saw steel and run in oil in separate compartment. Gears are made from Chrome Vanadium Steel. We also furnish control levers. We build a variety of both spur and bevel types of differentials. Our steering gears are built to stand up under all conditions.

WARNER GEAR CO. - MUNCIE, IND.

to find out why
4895 Garages
are using a

SHALER ELECTRIC Vulcanizer

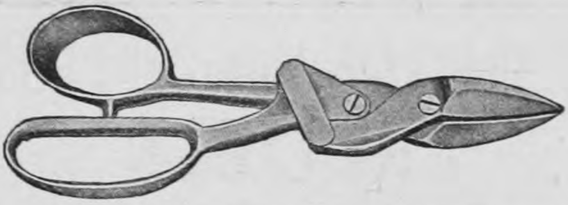


Type C puts the heat right where it is needed—against the new fabric.

If you are going to start a Garage or Repair Shop—or if you operate one now—go and see someone who is using a Shaler, or **write us now** and learn why a Shaler is part of the equipment of nearly every Garage in the United States.

There isn't room here to tell you of the extensive work they **are** doing or the **money** that **has been** earned with them.

C. A. SHALER CO., Box P,
WAUPUN, WIS., U.S.A.



These Shears Have
DOUBLE THE CUTTING POWER

The 7″ size has the cutting power of a 14″ Snip; other sizes have cutting power in proportion—all sizes cut as easily at point as at any place between blades. Try a pair of

SEARIGHT'S
COMPOUND LEVER
MECHANICS' SNIPS

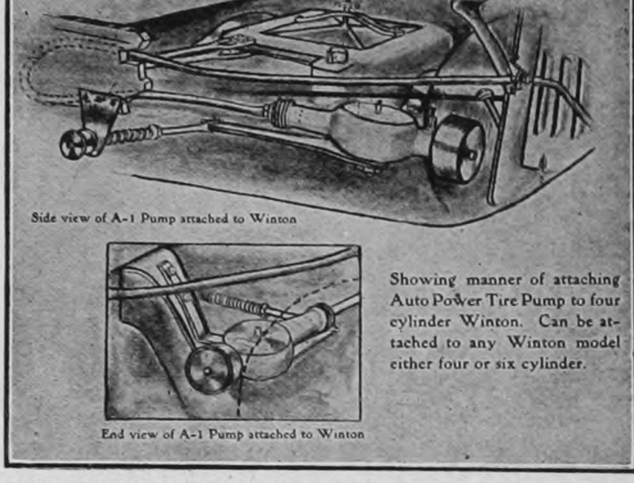
Prove to yourself that these Snips are exactly what you need. Designed on scientific principles; the compound lever insures enormous cutting power without strain or effort. All sizes made of crucible shear steel, correctly tempered; fully guaranteed.

Three sizes—7, 8 and 10″ now ready; the 12 and 14″ sizes to follow.

7″ size, made of sheet steel—other sizes from drop forgings. Curved blade for cutting circles and curves.

Sent prepaid on receipt of price: 7″, $1.25; 8″, $1.75; 10″, $2.25. Your money back if you are not satisfied.

DETROIT SHEAR COMPANY



Side view of A-1 Pump attached to Winton

End view of A-1 Pump attached to Winton

Showing manner of attaching Auto Power Tire Pump to four cylinder Winton. Can be attached to any Winton model either four or six cylinder.

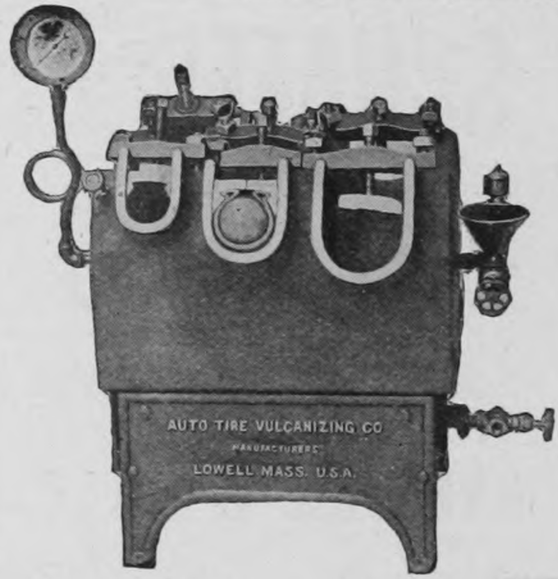
YE NEW YORK SHOWMEN

We present herewith cut of the "Winton" four showing the Rohrbacher Wind Jammer firmly bolted to car.

WHAT THE PUMP WILL DO

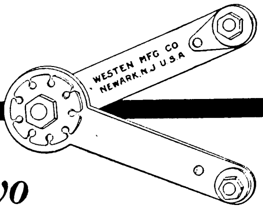
It will inflate your tire to 80 lbs. pressure in two minutes. It will instill confidence on your tour and increase your pleasure, as the flat tire is no longer feared. It will save 75% of your tire expense. It is easily installed. Is operated without trouble. Is worth the price of your Auto when past annoyances are considered. Costs $25.00, expressed to destination. Do not peek through the key-hole of doubt at this little wonder before you lift the latch. Let her in—install her on your car; she will not only jam your tires, but will jam away your tire troubles. Let us hear from you.

Rohrbacher Automatic Air Pump Co.
Portland, Oregon



Our New No. 7

1910 Model Adjustable Sectional Vulcanizer with three cavities. Capacity from 2″ motorcycle to 4½″ automobile tires. It has 12 pair of bead irons, thus insuring a perfect fit for all the various makes of tires, either Clincher, Dunlop or Goodyear style of Fisk mechanically fastened, also the double Clincher type of motorcycle tire. This vulcanizer is furnished with gas or gasoline burner or to connect direct with steam boiler. Our new 1910 vulcanizer is cast in one piece and is steam jacketed like all our other vulcanizers. You cannot afford to be without our three cavity adjustable sectional vulcanizer. It is a money saver and a money maker. Write for catalogues and discounts.



Two Friction Planes

Two friction planes in your shock absorber make a difference. One—the smaller—stops the disagreeable and damaging vibration of the vehicle-body and prevents the crystallization of springs. The other checks the excessive rebound, eliminates the bounce and makes the body ride easy. Both reduce the cost of upkeep.

Westen shock absorbers are the only absorbers that automatically adjust themselves to any load or road conditions and are self-lubricating. They offer different degrees of resistance to the action of the vehicle springs under varying conditions. Once attached, no adjustments necessary. Ask your dealer or send direct for interesting booklet.

WESTEN SHOCK ABSORBER

The Only Two Friction Plane

WESTEN MANUFACTURING CO.
298 HALSEY STREET, NEWARK, N. J.

We Make FENDERS

and

Guarantee Delivery

Ask us about it

Metal Stamping Co.
Jackson, Mich.

SCHAFER BEARINGS

(MADE IN GERMANY)

BARTHEL & DALY
42 Broadway
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SOLE IMPORTERS

Write for Catalogue and Price List

Do Your CRUCIBLE STEEL CASTINGS

give you entire satisfaction, both in regard to quality and price ?

If not, send us a trial order and let us prove to you that our castings are without competition. Our facilities enable us to make deliveries on time—an important consideration, as delay means loss to the manufacturer who must get his output through on time.

Our prices will also interest you, as they are as low as is consistent with quality.

Vanadium Steel Castings a Specialty

Keystone Steel Castings Co.
CHESTER, PA.

DEALERS ONLY

Do not fail to send for our proposition on

TIRE CHAINS

No dealer can afford to miss it and we can only offer it to a limited number, so

QUICK ACTION WILL BE NECESSARY

Empire Auto Supply Company

283-285 HALSEY STREET :: :: :: NEWARK, NEW JERSEY

1910 CORREJA CAR

$2200.00

THERE IS A REASON WHY

If you pass it by you are a dead one.

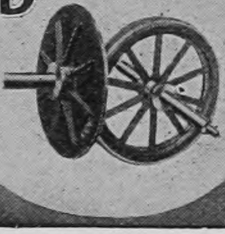
A High Grade Car built of the Best Material obtainable.

4 cylinders, 50 H. P.

Silent and Powerful.

Vandewater & Co.
71 to 79 Prince Street
ELIZABETH, N. J.

ROCKWOOD Paper Frictions



The Maximum Engine Load at All Times

Is possible only in a friction-drive car, with speed changes, in unlimited variety, instantly made without noise or fear of breakage. Great power saving.

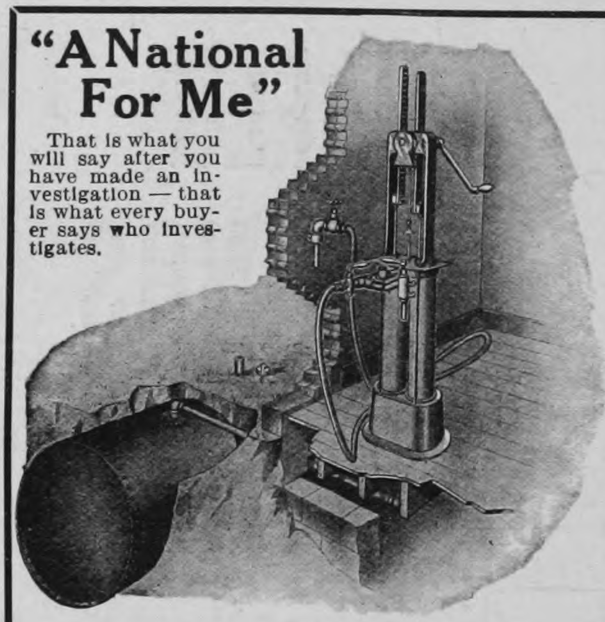
Rockwood Paper Frictions are the standard for friction drives.

Our treatise, **"Friction Transmission,"** gives valuable facts and formulas for the designer. *Sent free on request.* State occupation and firm connected with. Assistance in designing cheerfully furnished.

The Rockwood Mfg. Co.

"A National For Me"

That is what you will say after you have made an investigation — that is what every buyer says who investigates.



THE REASONS WHY

1. **Double Action** — less possibility of wear.
2. **Perfect Construction** — always measures and works accurately.
3. **Mechanically Designed** — insures against possible defects.
4. **No Lost Motion** — makes every stroke count.
5. **Correct Registration** — you have a record of withdrawal.
6. **Sold Right** — Distinctly on its merits.

The National Gasoline Storage Outfit—in fact the entire line of National Pumps and tanks are pronouncedly THE BEST. Write us TODAY for full details

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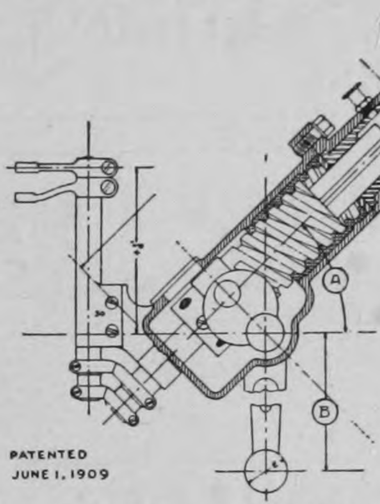
"S & W"
Safety Electrically Welded
STEERING REACHES

Durable and Strong



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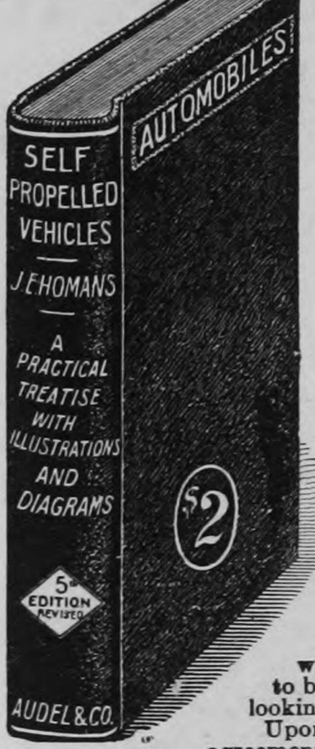
JUNE 1, 1909

The SCHWEPPE & WILT MFG. CO.
Meldrum and Champlain Sts.
DETROIT, MICHIGAN



pelled Vehicles" gives full details on successful care, handling and how to locate trouble.

Beginning at the first principles necessary to be known, and then forward to the principles used in every part of a Motor Car.

It is a thorough course in the Science of Automobiles, highly approved by manufacturers, owners, operators and repairmen. Contains over 400 illustrations and diagrams, making every detail clear, written in plain language. Handsomely bound.

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Kindly mail me copy of HOMANS' AUTOMOBILES, and, if found satisfactory, I will immediately remit you $2.00, or return the book to you.

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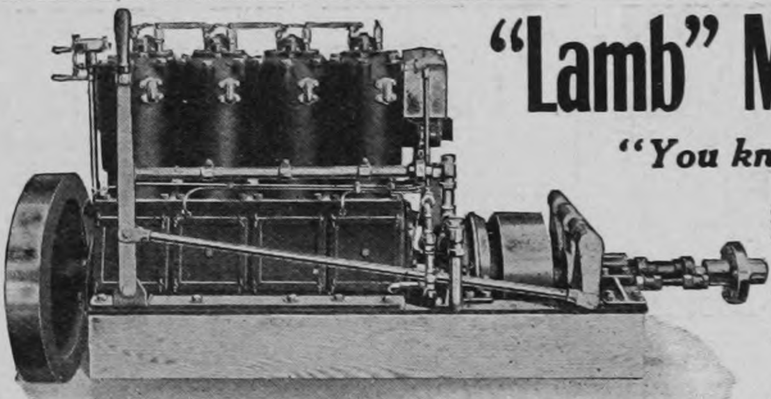

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"You know the Engine"

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Also Small Sizes in the Two Cycle Type

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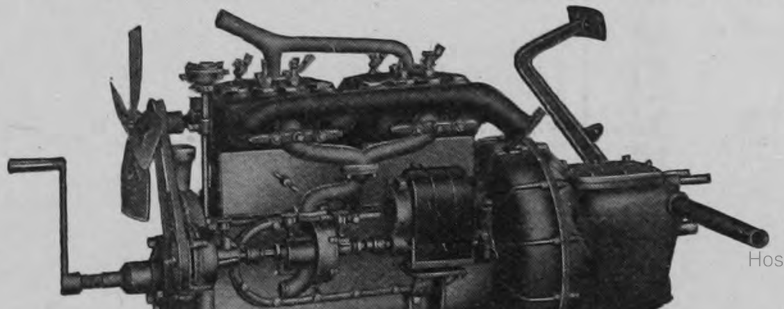

Motor, Disc Clutch and Transmission IN ONE UNIT

SIMPLE
POWERFUL
LIGHT

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HAZARD ENGINEERING COMPANY

THE 1910 Lexington $2500

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THE LEXINGTON has "made good" in every sense of the term, and represents better value than any other car on the market selling at the same price. Send for complete specifications. They will convince you.

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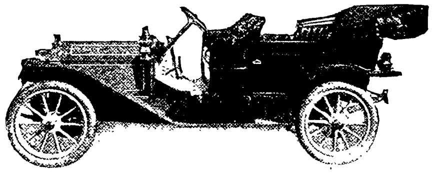
Touring Car **Roadster** **Short Coupled Body**



Model A—5 or 7-Passenger Touring Car

The Lexington Motor Car Co., Inc.
LEXINGTON, KY.

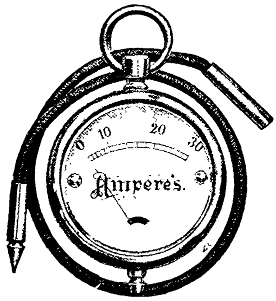
WOOL FELT

DUST AND OIL WASHERS

DIES OF ALL SIZES FOR CUTTING

TINGUE BROWN & CO.
64 Reade St., New York City

THE SENSATION OF THE SEASON



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LOOK FOR THIS DESIGN Amperes **And be assured of getting the best**

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Delco Ignition is the only battery system ever made which can be run

TEN THOUSAND MILES WITHOUT ADJUSTMENT

Right design and expert manufacturing methods make this possible. It ought to be on your car.

The Dayton Engineering Laboratories Co.
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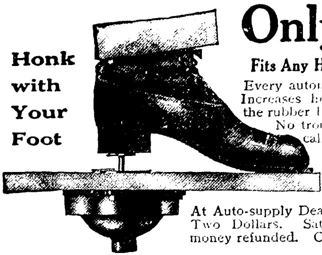

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Fits Any Horn-Tube On Any Car.

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We Guarantee It for 5 Years

At Auto-supply Dealers or sent prepaid for Two Dollars. Satisfaction guaranteed or money refunded. Catalog free. Write today.

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Our Specialty is

Cut Steel Gears

Interchangeable, carried in Stock. Transmission and Differential Gears. Steering Devices. Chains and Sprockets. Our Worms and Sectors excel in workmanship. Catalog E2 has full lists of Standard Gears.

Boston Gear Works, Norfolk Downs, Mass.

¶ Selective type transmission, 24-30 horse power, three speeds forward — one reverse.

¶ Four types of steering gears for cars from 1,000 to 4,000 pounds in weight.

¶ Three sizes universal joints, self-lubricating and dust proof, 18-40 horse power.

¶ "Non-Swell" silent running filled gears that will run in dope.

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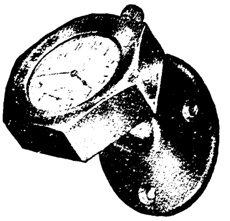

Perfection Auto Clock

A neat and accurate Dash Clock Post Paid

$4.00

Perfection Auto Clocks are made from cast brass and highly polished and nickel plated. Have a good 24-hour watch movement, stem winding, stem setting, also large plain figures Write for trade discounts.

Manufactured by

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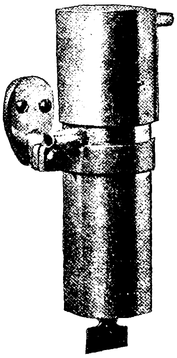

Pat. July, 27, 1909

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THE ASHTON

Acetylene Separator

PRICE, $5.00

Won't Generate Gas BUT WILL

Prevent clogging and never necessary to blow out pipes. **Lights never go out.** Used with any generator. Send for pamphlet. Mailed on receipt of price. Liberal discount to the trade.

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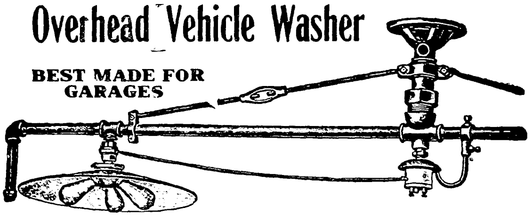

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Seamless Brass and Copper Tube

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Arthur T. Rutter & Co., 256 Broadway, N. Y. City

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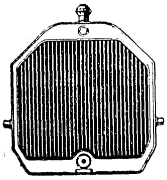

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ROME-TURNEY RADIATOR CO.
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HELMET OIL for AUTOMOBILE BEARINGS

FOR AUTOMOBILES:—Use on all bearings except cylinders. Can be used in all climates and seasons. Write for our interesting and practical booklet, "Auto Lubrication," mailed free. A liberal quantity free. Write us your dealer's name and we will have him deliver you a Free Test sample to try.

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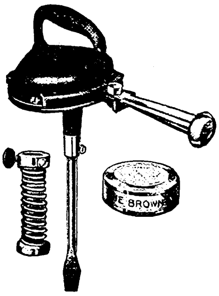
MODEL R
STEERING GEAR

FOR RUNABOUTS AND AUTO-BUGGIES

THE F. H. BULTMAN CO., CLEVELAND, O.



GRIND YOUR VALVES NOW

Don't put your car away in a slipshod manner. More harm is done by this than a season's run. The Grinder will do the work in one-third of the time. Valve is lifted automatically by our system. Thousands in use.

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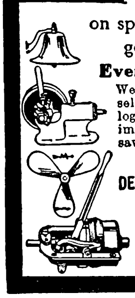

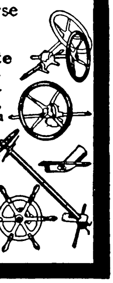

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We want every man who builds, owns or sells a boat to get our 60-page free catalog. Prices right, satisfaction guaranteed, immense stock, prompt shipments. You save money by getting catalog today.

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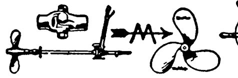

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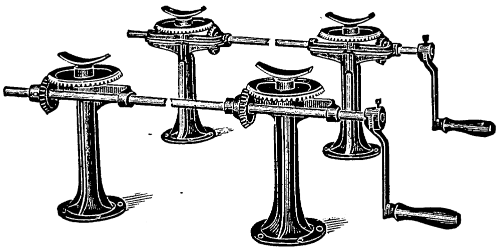
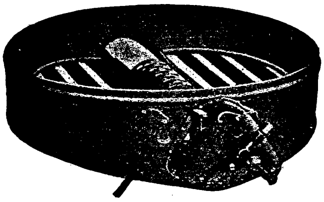
Saves tires and eliminates the dangerous Pit. Let us tell you about it.



THE SHAWVER COMPANY, Springfield, O.

THE BURNER is the SOUL of a Steam Carriage



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HAS NO PEER

It fills the exact requirements of Steam Carriage owners. Safe, reliable, economical, the best in the world. Hundreds of well-pleased users testify to its merits. Send to us for descriptive matter and published names of users. We supply catalog giving new and important improvements.

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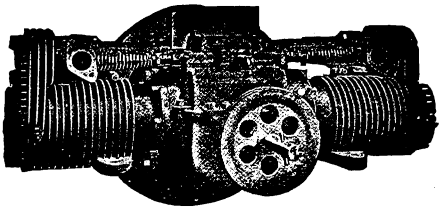

12 H. P., Air-Cooled, for Buggies
18 H. P., Air-Cooled, for Delivery Wagons

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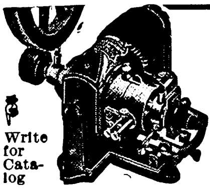
Bloomfield, N. J.



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Motsinger Auto-Sparker

and run it without the aid of batteries. Not a cheap magneto, but the original high grade speed controlled friction driven dynamo. Perfectly insulated, "water and dust-proof." **Fully Guaranteed.** Operates the "make and break" and "jump spark." Charges all storage batteries for ignition and lighting on a small scale, perfectly with our special switch board in the circuit. Ten years' actual service with over 36,000 Auto-Sparkers in operation to testify to its merit.

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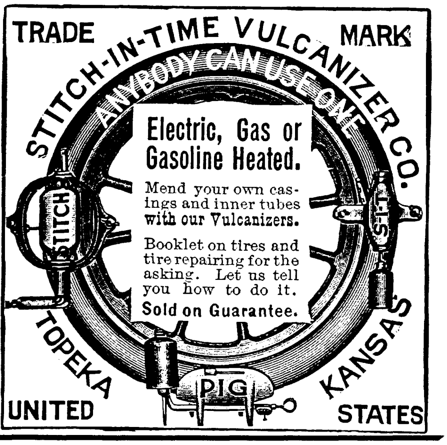

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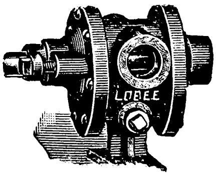

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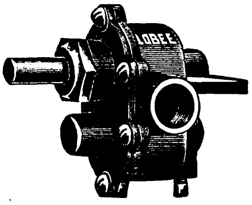

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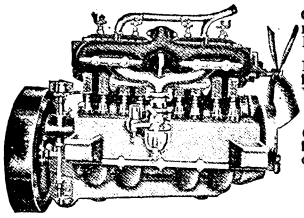

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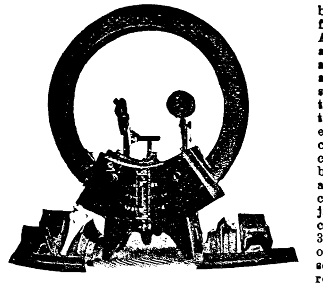

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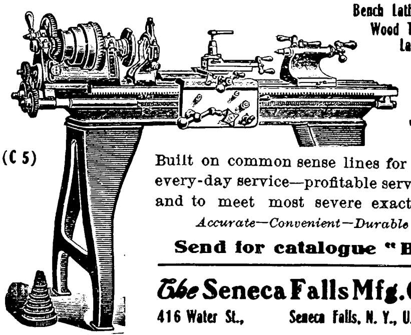

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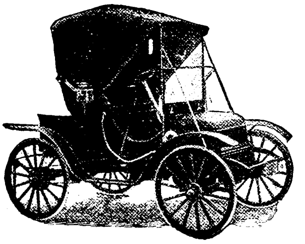

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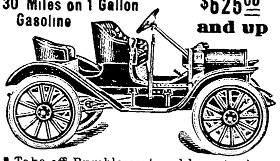

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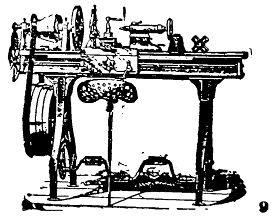

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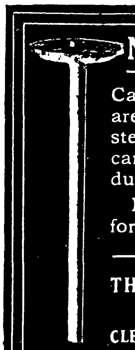

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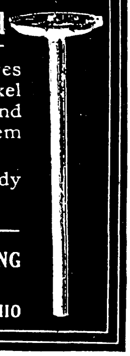

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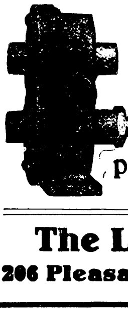

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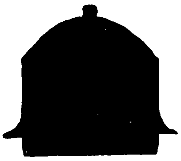

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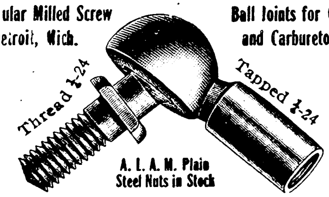
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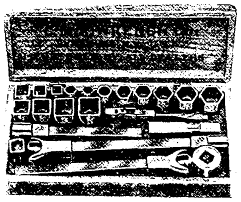

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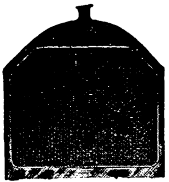

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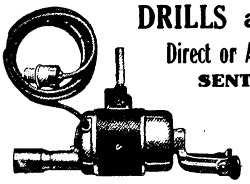

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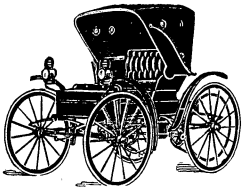

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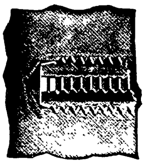

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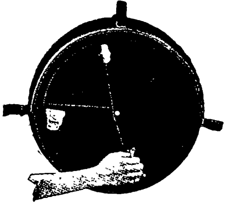

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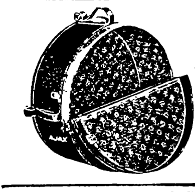

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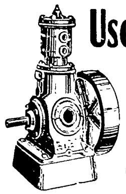

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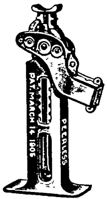

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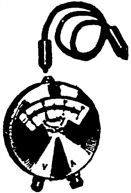

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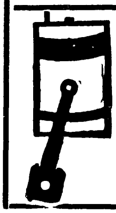

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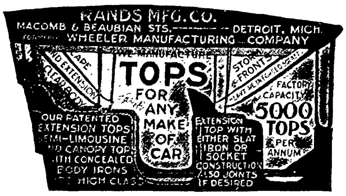
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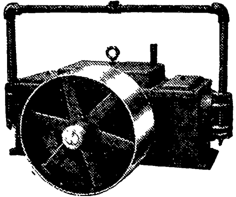

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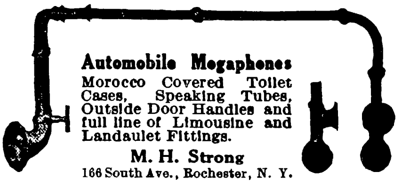

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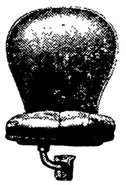

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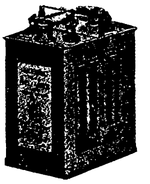

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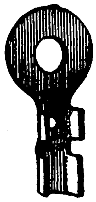

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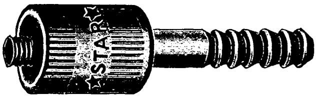

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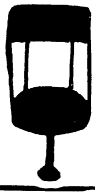

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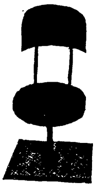

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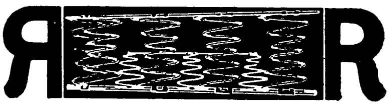

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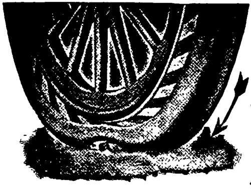

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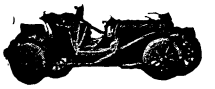

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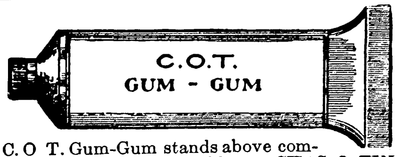

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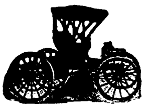

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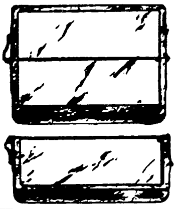

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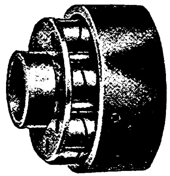

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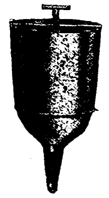

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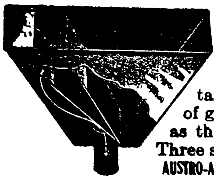

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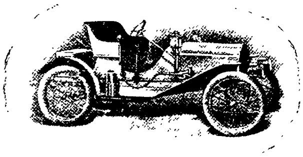

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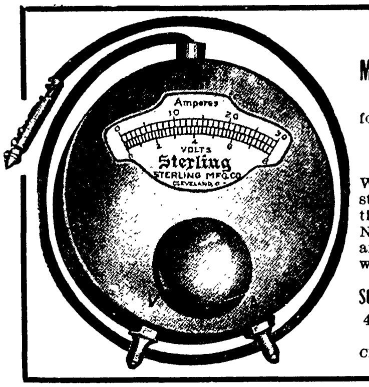

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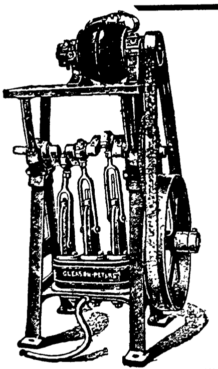

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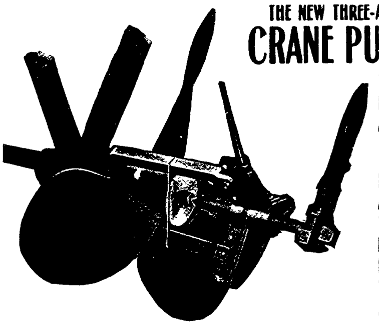

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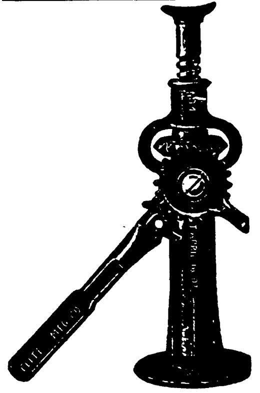

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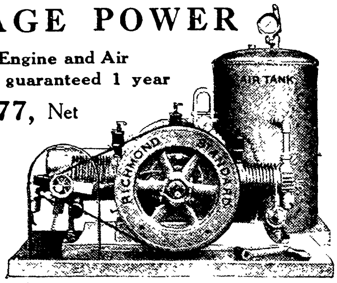

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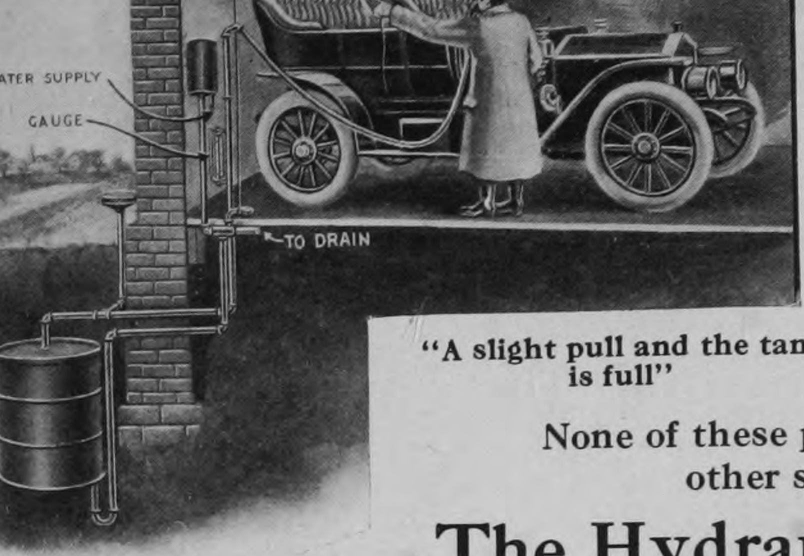

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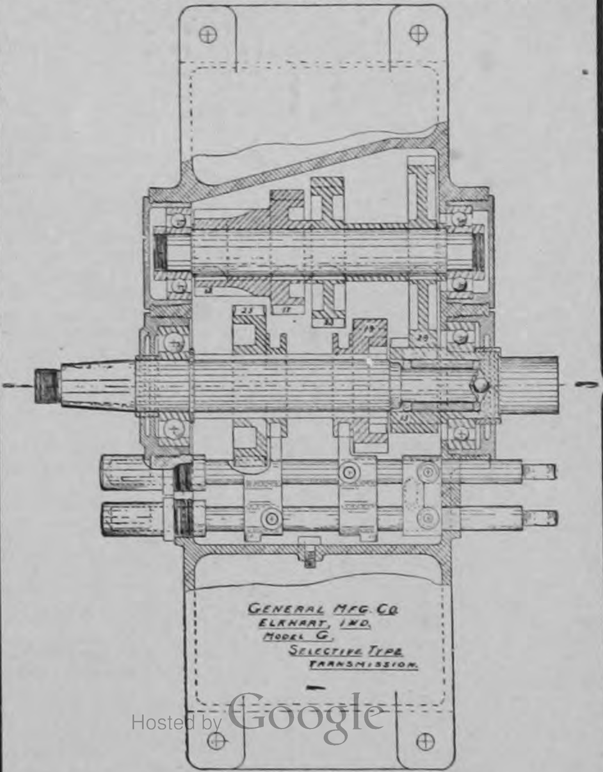

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Quality Unequaled

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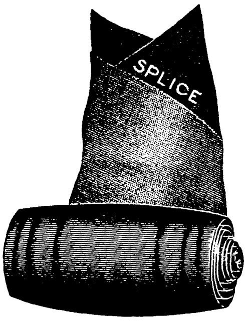

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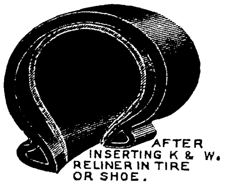

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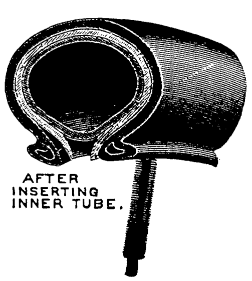

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Milwaukee Tire Repair
Company

Sept. 11, 1909.

I have used 4 or 5 of your reliners on my cars and find them to be the best thing to get the full wear out of shoes which are partly worn that I ever found.

Mr. G. M. Rosmier, Mgr.,
Pabst Garage & Taxicab,
New York City

Oct. 15, 1909.

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Mr. E. I. Emerson,
Montgomery, N. Y.

Sept. 21, 1909.

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G. W. Cowles, San Antonio, Tex.

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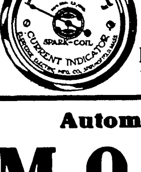

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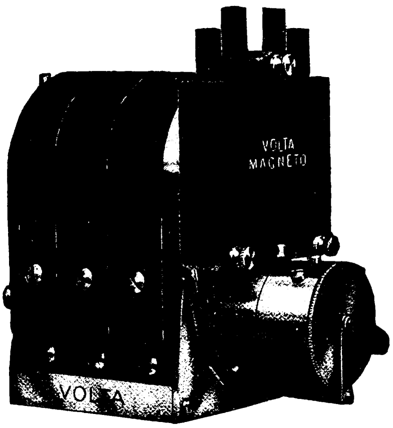
The VOLTA Magneto

"An Ideal Realized"



¶ It has been "manifest destiny" that, sooner or later, America would produce a magneto which would not merely equal but surpass the best hitherto made. ¶ The only questions have been

Who and When?

THREE years ago we resolved to make that distinction our own. We ignored price considerations and devoted ourselves solely to achieving the highest standard of workmanship while overcoming certain well-known defects of existing apparatus. For this work we were well equipped by the experience of fifteen years in the electrical field and several years of experience manufacturing magnetos for other concerns.

¶ To equal or surpass the best existing workmanship in magnetos was not difficult. Aside from that we aimed at the following results among others:

1. **Mechanical simplicity.** In particular we located the condenser on top of the pole pieces instead of on the armature.
2. **Greater durability of the interrupter.** Our interrupter has one roller instead of two. This roller, like the cam, is of hardened steel and lasts indefinitely.
3. **Ease of adjustment.** We made the cam rotate while the breaker box remains stationary. The contact screw can be adjusted while the magneto runs.
4. **Immunity from short-circuiting if wet.** The high-tension collector ring is located directly under the distributor and leads directly up into the latter. *One may play a hose on the Volta Magneto without short-circuiting it.*
5. **Immunity from oiling troubles.** By reason of a simple feature of construction oil may be squirted *ad libitum* into the bearings without affecting the interrupter or the high tension current.

¶ We cannot tell all about the Volta Magneto here, but will gladly send descriptive catalog on request. We have endeavored to make it the best magneto in the world, and we think we have succeeded.

PRICES

Type G, for small engines,	4-cylinder	$ 75.00
	6-cylinder	95.00
Type F, for large engines,	4-cylinder	100.00
	6-cylinder	120.00

Buffalo Ignition Company

41-43 East Eagle Street, Buffalo, N. Y.

On Sale by Witherbee Igniter Company, New York, Chicag Detroit, Baltimore, and by all dealers

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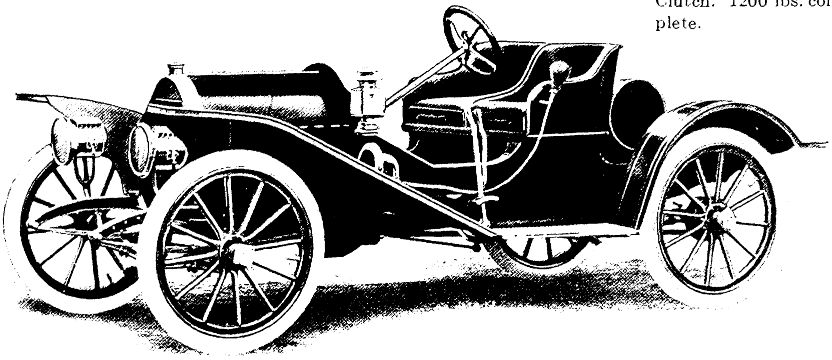
K-R-I-T

Made in Detroit

22 Horse Power **$800**

with **Bosch Magneto,** 96-inch Wheel Base, Sliding Gear Transmission, Multiple Disc Clutch. 1200 lbs. complete.



Built in Detroit by Men Who Know How

¶ We emphasize the classy lines, snappy, graceful style of the "saucy" K-R-I-T — the new car from Detroit. Look at the illustration—then note the specifications. ¶ The K-R-I-T unites class, speed, style, strength and power with light weight. You will recognize at once the value that spells BIG DEMAND. ¶ The factory is now in operation. We are building 1000 cars. Deliveries commence January 1. A few demonstrators sooner. Write at once for territory. First come, first served.

Three Models, Runabout, Roadster and Surrey

Condensed Specifications

Motor. 4 cylinders; 3¾-inch bore, 4-inch stroke; cast en bloc. Motor and transmission a unit with 3-point suspension. Crank shaft runs on two annular ball bearings. Connecting rods extra large in proportion to size of motor — frequent adjustment unnecessary. Float feed carburetor. The K-R-I-T makes 45 miles an hour easily—and better if you want it.

Transmission. Sliding gear type, 2 speeds forward and reverse; operated by one lever. Runs on ball bearings. Noiseless.

Clutch. Multiple disc, running in oil. No jarring when starting. Starts as readily on high speed as on low. Slight pressure of foot releases clutch.

Ignition. Bosch Magneto with set spark.

Oiling. K-R-I-T system, contained in motor. Adjustable. Impossible to get out of order.

Front Axle. Drop forged "I" beam of exceedingly neat design.

Rear Axle. Shaft driven. Ball and roller bearing throughout.

Springs. 2 semi-elliptical springs in front; 1 cross spring in rear, giving three-point suspension, insuring remarkably easy riding.

Wheels. Artillery type. 32x3 clincher tires. Wheel base, 96 inches. 56-inch tread.

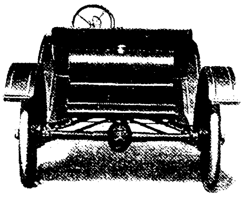
Steering Gear. Irreversible type. One control lever.

Brakes. 2 sets of internal expanding brakes.

Weight. 1250 lbs. complete.

Equipment. 2 dash and 1 tail oil lamp; horn; tire repair and tool kit.

Price. Runabout, $800. Roadster, $825, with single rumble. Surrey, $850, f. o. b. Detroit.



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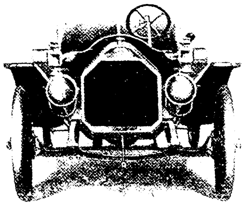
Make your applications for territory at once. There will be only 1000 K-R-I-T cars built for 1910. WRITE TODAY.



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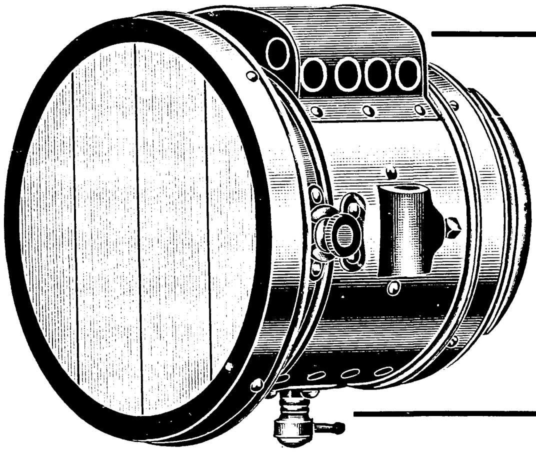

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Notice that repairing of this lamp is very easy, it being assembled by screws.

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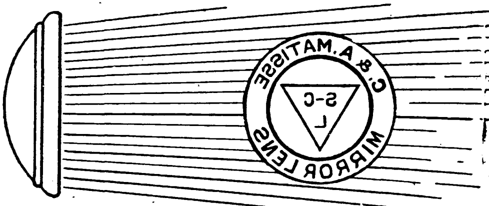

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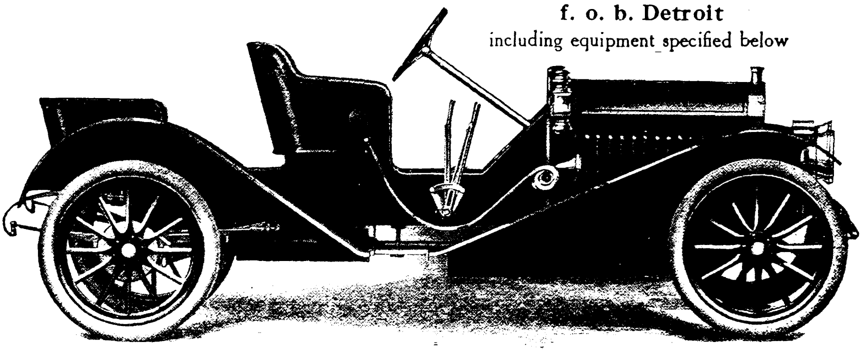
110″ Wheel Base
Dual Ignition System

24-26 H. P.—$1100

f. o. b. Detroit
including equipment specified below



Model A10, 24-26 H. P., Four Cylinders cast en bloc; Sliding Gear, Selective Type; Cone Clutch.

Warren-Detroit

Price includes Volta High Tension Magneto; three oil lamps, two gas lamps; generator; tire repair kit and tool kit.

Standard from Tires to Spark Plug

Here's a car standard from tires to spark plug. Nothing radical. No new freakish ideas —a practical, substantial machine that will do fifty miles an hour or better if you want it. It is a big car at a reasonable price; 24 to 26 H. P.; 110″ wheel base.

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Bore: 4 inches.
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Wheel Base: 110 inches.
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Clutch: Cone.
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Drive: Shaft.

DEALERS: **Please note there are only 500 Warren-Detroits coming through. Territory is going fast. Get busy. Write at once.**

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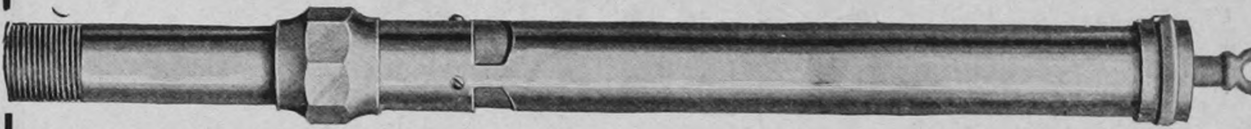
"The Whistle with the harmonious six-note bird-like trill"



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OUTFIT **$7.00** F. O. B. NEW YORK

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"Nightingale" can be attached by anybody in less than an hour

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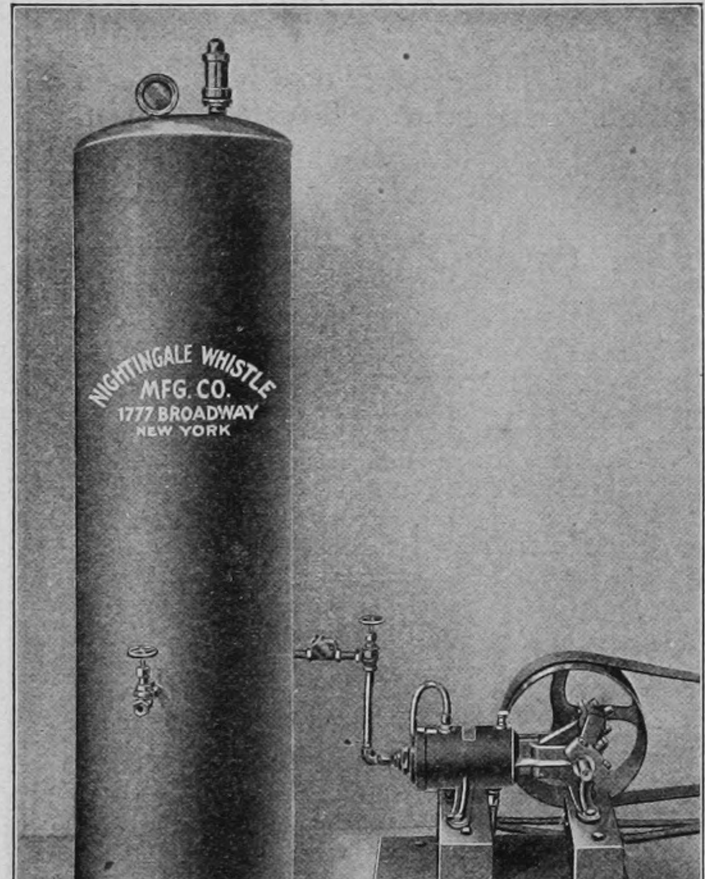

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Nightingale Whistle

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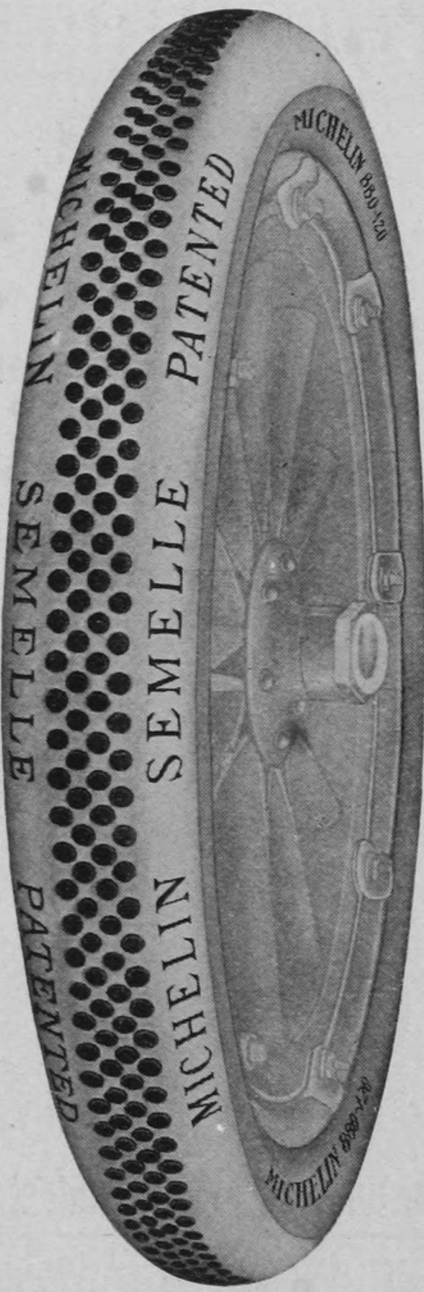
¶ MICHELIN TIRES are admittedly unequalled for speed, safety and endurance.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Indestructible Shut Off

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(Patented in U. S. A. and Foreign Countries)

Livingston Radiator & Mfg. Co. Inc.

SOLE AMERICAN MANUFACTURER

The U. S. LETTERS PATENT granted to D. McRa Livingston and now owned by this Company, cover ALL RADIATORS in which the VERTICAL FLATTENED WATER TUBES are so shaped as to produce a CIRCULATION HORIZONTALLY as well as VERTICALLY, and ANY OTHER RADIATOR having WATER TUBES of this FORM is an INFRINGEMENT.

A RADIATOR is EFFICIENT in proportion to its CIRCULATING ACTION, and this CIRCULATION of the WATER in its HORIZONTAL CHANNELS, INCREASES the length of its CIRCULATING ACTION **100** per cent.

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CYCLE AND AUTOMOBILE TRADE JOURNAL
(Published in Philadelphia)

Only Motor That *Cranks Itself*

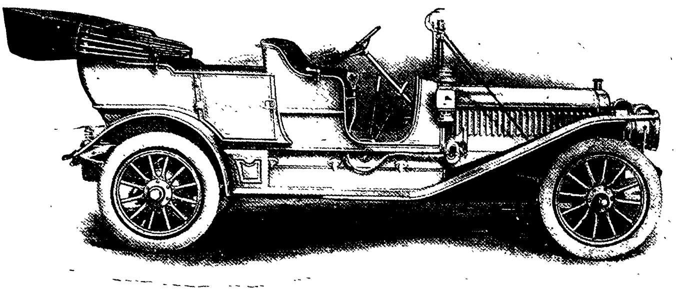
THE Winton Six motor ***cranks itself.*** It is the ***only*** motor that cranks itself.

* * *

Our system is not only a great convenience in saving labor, annoyance and humiliation to the car owner, but also—

It is the ***only natural method*** of starting the motor.

* * *



WINTON SIX

In the Winton Six, air pressure admitted to the cylinders causes the pistons to move through their various strokes.

During this movement, which draws in fresh gas, the spark occurs, igniting the charge and causing the motor to begin its regular operations.

Note that the pistons ***are already moving*** when the spark occurs.

That's important.

* * *

Some motors are advertised to "start on the spark."

That method is both ***uncertain*** and ***violent.***

* * *

To "start on the spark" there must already be gas in the cylinder.

If the gas isn't there, all the sparks in christendom ***will not start the motor.***

Therefore, you are never quite sure whether "she'll start" or not.

But, assuming that you are fortunate enough to have gas in the cylinder—what happens?

Just this: all the force of that charge of gas is ***shot*** against pistons that are ***standing dead still.***

The shock thus sustained by the entire train of pistons, the crank shaft and the bearings is like that suffered by a standing railroad car that is bumped by a locomotive going 20 miles an hour.

* * *

If you value your car and mean to treat it with consideration (so that it will not be prematurely bumped upon the junk pile) ***don't ever*** "start on the spark."

* * *

If your car isn't a self-cranking Winton Six, give it a fair show and ***crank it.***

If your car is a self-cranking Winton Six, you have the assurance that, by means of air pressure, you are starting the motor on the simplest, easiest and only mechanically perfect method known to the automobile world.

And no matter how often you use your Winton Six air starter, you are never injuring the motor.

* * *

This superiority of the Winton Six air starter is characteristic of the Winton Six from radiator to gasoline tank.

Look it over. It will pay you to know about the car that holds the world's record of 184,190 miles on $142.43 upkeep expense—expense that averages 77 cents per 1000 miles.

The price is a revelation. $3000 for our 48 H. P., five-passenger, six-cylinder Winton Six is a figure that dismays competition.

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Why not get our literature? It bristles with dollars-and-sense facts. Write today.

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Mean More Mileage
Less Expense
No Delays
Dollars Saved

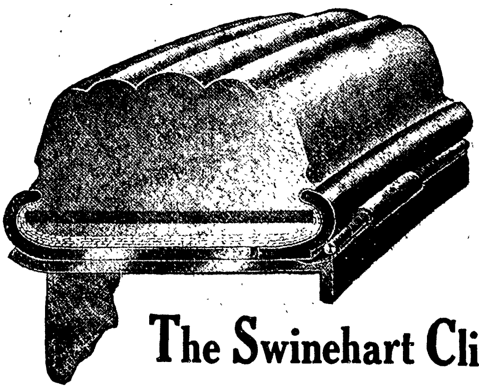
CONSIDER! Mr. Manufacturer, the advantages of our line before leaping into the uncertainty of 1910 season with an old-fashioned, inefficient, unimproved, inconvenient tire equipment.

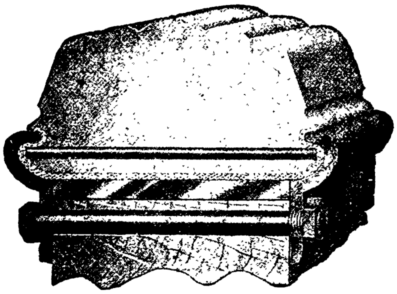
CONSIDER! Mr. Manufacturer, that truck owners in general are no longer buying tires because they are cheap.

CONSIDER! Mr. Manufacturer, that more Swinehart tires are used in New York and Chicago (the great commercial car fields) than any other make, because they give from 20% to 50% more service, and are more convenient to apply.

CONSIDER! Mr. Manufacturer, every time your customers are forced to lay up their cars for repairs to tires or renewals, it costs them from $10 to $50 per day, and consider that Swinehart quick detachable rims eliminate all such delays.

Save Your Customers Money and Improve the Reputation of Your Car by Using Swinehart Tires





Flange Rim For Wood Wheels

¶ The success of our quick detachable rims during past seasons has demonstrated that truck owners appreciate this feature.

¶ Our clincher tires with improved quick detachable flange rims make it possible for an amateur to change tires in thirty minutes. The nuts on one side are simply taken off, one flange removed, old tire slipped off, new one put on and flange replaced. No tools other than wrench and a few bars required.

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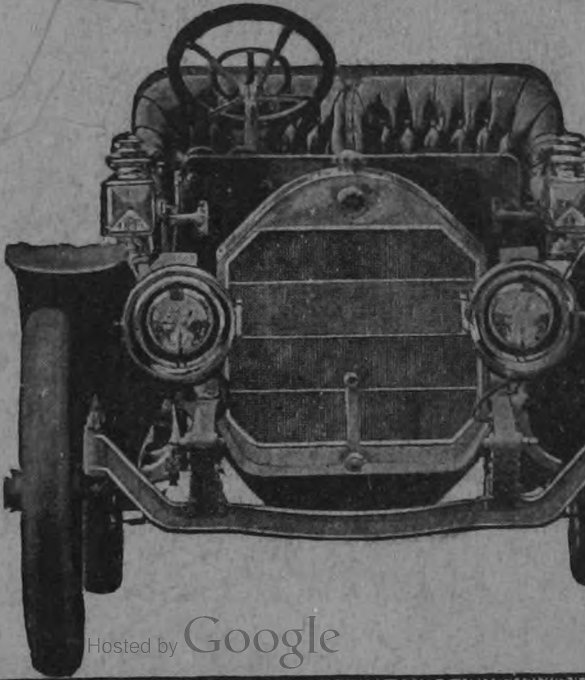

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